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GUIDE-BOOK FOR PUPIL-TEACHERS

TWO YEARS' PAPERS FOR CANDIDATES
AND PUPIL-TEACHERS

EMBRACING ALL THE QUESTIONS SET, WITH NUMEROUS ADDITIONS,
SOLUTIONS, AND ALL THE ANSWERS TO THE ARITHMETIC

BY

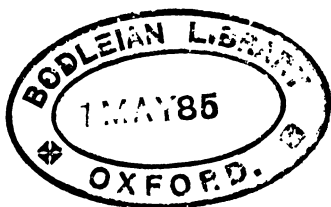
JAMES BEVERIDGE

HEAD-MASTER, CHURCH OF SCOTLAND NORMAL SCHOOL, GLASGOW



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P R E F A C E.

THIS book presents, in a handy form, the questions actually set in the Government Examinations (Scotland) for the past two years to Candidates for Pupil-Teachership and to Pupil-Teachers at the end of their First Year.

Specimen Solutions are given, and the Answers to all the Arithmetic Questions—400 in number—will be found at the end of the book.

Additional questions in Arithmetic of a more advanced type have been scattered through the work to carry the pupil a stage beyond the actual requirements.

This book will not only meet a widespread want on the part of those for whom it is intended, but Teachers will find it a valuable aid in the instruction of their advanced pupils.

Particular attention is drawn to the Solutions and Modes of Analysis.

J. B.

December 1884.

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PUPIL-TEACHER EXAMINATION PAPERS.

CANDIDATES—MALES.

ARITHMETIC.

1. A leg of mutton, weighing $9\frac{1}{2}$ lb., cost 6s. 4d. ; find the value of 6 sheep, each weighing 1 cwt. 2 lb., at the same price.
2. If 10 men do a piece of work in 9 days, how many men will do another piece four times as great in two-thirds of the time ?
3. Find, by Practice, the value of 19 cwt. 3 qr. $24\frac{1}{2}$ lb., at £10, 6s. 8d. per ton.
4. Find, by Practice, the value of $6754\frac{3}{4}$ articles at £2, 1s. 5d. each.
5. A gentleman pays a tax of 4d. in the £, amounting to £21, 13s. 4d. ; on how much was the tax paid ?
6. What sum will gain £16, 8s. in five years, if £100 gain £4 in one year ?
7. Find, by Practice, the price of 37 cwt. 3 qr. 17 lb. of coffee at £8, 17s. 4d. per cwt.
8. If the sixpenny loaf weighs 2 lb. 3 oz. when wheat is selling at 64s. per quarter, what should it weigh when wheat is selling at 56s. ?
9. If 3 men earn £15 in 20 days, how many men will earn 15 guineas in 9 days at the same rate ?

10. Find, by Practice, the rent of 23 ac. 3 ro. 16 po., at $2\frac{1}{2}$ guineas per acre.

11. If 200 guineas be required to keep one hundred and seventeen persons for a fortnight, what sum will keep 26 persons during the months of December and January?

12. Sugar was bought at £1, 15s. per cwt., and sold at $4\frac{1}{2}$ d. a lb., thus making a profit of £1, 19s. $9\frac{1}{2}$ d.; what quantity was bought?

13. Find, by Practice, the value of $118\frac{1}{2}$ tons of iron at £4, 11s. $9\frac{1}{2}$ d. per ton.

14. Find, by Practice, the value of $117\frac{1}{4}$ articles at £3, 17s. 10d. each.

15. Find, by Practice, the cost of 6 qr. 3 bushels at £2, 2s. 6d. per quarter.

16. What is the value of wheat per bushel, when four quarters and a half cost £10, 2s. 6d.?

17. If 22 men can build a wall 80 yd. long, 2 yd. wide, and 4 yd. high, in 33 days, how high a wall 60 yd. long, and 1 yd. wide can 16 men build in 18 days?

18. Find, by Practice, the value of $6754\frac{2}{3}$ articles at £2, 11s. 5d. each.

19. Find, by Practice, the value of 13 lb. 10 oz. 15 dwt. 20 grains, at £1, 18s. $6\frac{1}{2}$ d. per ounce.

20. If 5 miles 6 fur. 10 po. of railway can be laid by 280 workmen in 140 days, in what time would 1400 workmen lay the same distance of railway?

21. If 18 yd. 2 qr. of cloth, $\frac{3}{4}$ of a yard wide, cost 30 shillings and sevenpence halfpenny, what length of cloth, half a yard wide, can be bought for twice that sum?

22. Find, by Practice, the value of a bankrupt stock, priced for sale at £1440, but valued at 19s. $3\frac{1}{2}$ d. in the £.

23. A bankrupt compounded with his creditors for 9s. 6d. in the £; how much was lost in a debt of £112, 10s.?

24. Nine men take seventeen days to a certain work ; how many men must I hire to do a work twice as large in double the time ?

25. My nominal income is £384 a year, but my taxes of all kinds amount to 1s. $3\frac{3}{4}$ d. per £ of my income. Find, by Practice, my income after deducting the taxes.

26. What will be the cost of 12 tons 15 cwt. 2 qr. 8 oz. at £12, 10s. per ton ?

27. If a farthing be the tax on a pound sterling, on what sum would 15s. 6d. be the tax ?

28. In how many days of ten hours each would 60 men dig a trench 100 yd. long, $2\frac{1}{2}$ yd. wide, and $4\frac{1}{2}$ ft. deep, when 15 men can dig one 250 yd. long, 2 yd. wide, and $2\frac{1}{6}$ ft. deep in 40 days of 8 hours each ?

29. Find, by Practice, the value of $4562\frac{1}{2}$ articles at £3, 15s. $9\frac{1}{2}$ d. each.

30. Find, by Practice, the value of 6 tons 7 cwt. 2 qr. 17 lb. at £3, 10s. 7d. per cwt.

31. If £52, 18s. 9d. be given for 40 yd. 2 ft. 10 in. of brickwork, how many yards can be built for £101, 15s. ?

32. A field, measuring 10 acres, and worth 41s. an acre yearly, is exchanged for one worth 40s. an acre yearly. Find the extent of the second field.

33. Find, by Practice, the price of 3 cwt. 2 qr. 17 lb., at the rate of £1, 5s. 8d. per quarter.

34. If 44 men take 45 days to a certain work, how many men could do it in 44 days ?

35. A contractor purchases 46 tons 7 cwt. of potatoes for £145, and sells them at $5\frac{1}{2}$ d. per stone of 14 lb. Find his profit.

36. If 2 acres of my farm be worth seven of my neighbour's, and my farm of 350 acres be rented at £770, what is the extent of my neighbour's farm, for which he pays £275 ?

37. If a pair of boots cost £1, 19s. 11d., find, by Practice, the value of eight thousand two hundred and sixty-one pairs.

38. A man working 12 hours a day can complete a certain piece of work in 7 days; how many hours a day must he work to complete a piece of work 3 times as large in 28 days?

39. How many lbs. of coffee at 2s. 9d. per lb. are equal in value to 426 lb. of tea at 3s. $4\frac{1}{2}$ d. per lb.?

40. If I buy 300 yards of lace at 3 yards for a shilling, and sell it at the rate of 5 yards for two shillings, do I gain or lose, and how much?

41. Find, by Practice, the value of 13 cwt. 3 qr. 17 lb. of tea at £448 per ton.

42. Find the income-tax on £1191, 3s. 9d. at 16d. in the £.

43. How much silk may be bought for £18, 3s. 10d., if 10 yd. 2 qr. cost £2, 11s. $7\frac{1}{2}$ d.?

44. If 12 men, working 9 hours a day, can build a house in 70 days, in how many days might it be built by 63 men working 8 hours a day?

45. Find the value of 750 oxen at $8\frac{1}{2}$ d. the lb., and 3508 sheep at $6\frac{1}{2}$ d., assuming 4 cwt. as the weight of an ox, and 12 stones as that of a sheep.

46. Reduce nine million forty thousand and twelve inches to miles, furlongs, poles, &c.

47. Find the price of 4 tons 13 cwt. 2 qr. 21 lb. at £20, 8s. 8d. per cwt.

48. 15,000 bricks, each 10 inches long and 4 inches wide, are required to pave a court; how many bricks would be required if each brick were 12 inches long and 5 inches wide?

49. Find, by Practice, the value of $8026\frac{1}{3}$ articles at £2, 16s. $10\frac{1}{2}$ d. each.

50. Find, by Practice, the value of 4 tons 11 cwt. 3 qr. 22 lb. at £2, 7s. 3d. per cwt.

51. If the yearly profits of an investment be £9, 16s. 8d. per cent., how much must be invested in order to produce an annual return of £232, 6s. 3d.?

52. If 780 men, on full rations, consume 91 quarters of wheat in 49 days, how many on *half* rations will consume 69 quarters in 9 days?

53. Find, by Practice, the cost of making a road of 19 miles 2 furlongs 88 yards at £50, 16s. 8d. a mile.

54. A farm, which contains 200 acres 1 rood 10 poles, lets at £2, 2s. per acre; what is the annual rent of the farm?

55. If 24 men perform a piece of work in 20 days, how many men must be employed upon a piece of work 6 times as large, that it may be finished in one-fifth of the time?

56. If 5 cwt. 14 lb. are carried 96 miles for £1, 12s. 6d., what weight ought to be carried 151 miles 6 fur. $3\frac{1}{3}$ poles, for the same money?

57. A contractor engages to make a railway 189 miles long in 15 months. He employs 256 men, who in 3 months complete only 28 miles. How many new hands must he employ to finish his contract in the given time?

58. Find, by Practice, the cost of 207 qr. 3 bushels $2\frac{1}{2}$ pecks, at £1, 16s. 8d. per quarter.

59. Find, by Practice, the cost of 17 square yards 4 square feet 76 square inches, at £13, 10s. per square yard.

60. If the sixpenny loaf weighs 2 lb. 3 oz. when wheat is selling at 64s. per quarter, what should be the selling price of wheat when the sixpenny loaf weighs $2\frac{1}{2}$ lb.?

61. If 2 horses plough $4\frac{1}{2}$ acres of land in 6 days, when they work 8 hours a day, how many acres will 16 horses plough in 156 days, when they work $12\frac{1}{2}$ hours a day?

62. A farmer engages 40 reapers to cut his crop of 400 acres, and in 8 days they cut down 60 acres; in what time will they cut down the remainder of the crop?

63. If the carriage of 10 cwt. 1 qr. for 30 miles come to 6s. 6d., how far should 20 cwt. be carried for the same money?

64. What is the gain on £150, at $3\frac{1}{4}$ d. on the shilling?

65. What is the price of 2 gallons of whisky, at 8d. per gill?

66. Calculate the value of $215\frac{1}{4}$ articles at £1, 10s. each.

67. 15 yards 2 qr. at 15s. $6\frac{3}{4}$ d. per quarter.

68. Calculate the value of $836\frac{3}{8}$ articles at 7s. $7\frac{1}{2}$ d. each.

69. A merchant bought 6 cwt. 1 qr. 14 lb. of goods for 2s. 4d. per lb., and sold the whole for £104, 18s. Whether did he gain or lose, and how much?

70. If $4\frac{7}{8}$ oz. of gold be worth £19, 12s. 6d., what is the value of 3 lb. $11\frac{2}{3}$ oz.?

71. If 8 men can mow a field in $18\frac{3}{4}$ hours, in how many hours can 15 men mow the same field?

72. Find, by Practice, the cost of $6452\frac{6}{11}$ articles at £2, 4s. $4\frac{1}{2}$ d. each.

73. Find, by Practice, the cost of 1298 articles at 17s. $9\frac{3}{4}$ d. each.

74. Find, by Practice, the value of 954 articles at £76, 15s. $2\frac{3}{4}$ d. each.

75. Find, by Practice, the cost of $785\frac{1}{4}$ articles at £57, 15s. $7\frac{1}{4}$ d.

76. If I can travel 198 miles by train for £2, 9s. 6d., how far ought I to be carried at the same rate for £8, 0s. $10\frac{1}{2}$ d.?

77. A bankrupt's debts are £7357, and he is able to pay 12s. $9\frac{1}{2}$ d. in the £; what are his effects worth?

78. Find, by Practice, the value of $5694\frac{1}{2}$ at £3, 11s. $9\frac{3}{4}$ d.

79. Find the value of $9741\frac{1}{10}$ at £1, 2s. $9\frac{3}{4}$ d.

80. What quantity of wine, at the rate of £31, 16s. 4d. per 46 gallons, may be got for £117, 11s. 8d.?

81. A cup weighing 11 oz. 18 dwt. 8 gr. is worth £5, 18s. 9d.; what is the value of a goblet weighing 3 lb. 8 oz. $19\frac{1}{4}$ dwt. at the same rate?

82. A floor can be covered with $32\frac{1}{2}$ yards of drugget 7 quarters wide; how many yards of Brussels carpet 26 inches wide will cover the same room?

83. Find, by Practice, the value of three million forty thousand two hundred and seven yards of silk at 4s. $11\frac{1}{2}$ d. per yard.

84. What is the cost of $11,513\frac{3}{4}$ articles at £9, 18s. 9d. each?

85. If a garrison's provisions last 95 days at the rate of 15 oz. to each man per day, what must each be allowed that the provisions may last 120 days?

86. A garrison of 5400 men is furnished with provisions for 10 months, but fearing an attack from the enemy, 3600 are sent to reinforce the place; how long will it hold out before the provisions are spent?

87. If one barrel costs £15, 3s. $10\frac{1}{2}$ d., what should be charged for $394\frac{3}{4}$ barrels? (By Practice.)

88. Find the value of ten thousand and fifteen and five-sixths at £3, 12s. $9\frac{1}{2}$ d. each. (By Practice.)

89. My agent, collecting rents at a commission of $4\frac{2}{3}$ per cent., paid me, after deducting his commission, £1482, 3s. 9d. What amount of rents did he collect?

90. A house and land were sold for £8963, and the owner received £8626, 17s. 9d. as the net proceeds. What was the rate of commission?

91. $397\frac{1}{2}$ at £5, 10s. $0\frac{1}{4}$ d. (By Practice.)

92. Find the price of $749\frac{6}{11}$ cwt., at 11s. 8d. per cwt.

93. What is the value of 9 cwt. $4\frac{3}{4}$ lb. at £2, 18s. $9\frac{2}{3}$ d. per cwt.?

94. Find, by Practice, the value of $8643\frac{3}{4}$ yd. at 4s. $11\frac{1}{10}$ d. per yard.

95. If 84 men mow 72 acres of grass in 15 days, how many acres will 96 men mow in 12 days?

96. If £350 gain £7, 17s. 6d. in 219 days, how much interest will £100 gain in 365 days?

97. Find, by Practice, the value of 4325 gallons at £1, 16s. 8d. per gallon.

98. The rents of a parish amount to £1750, and a poor-rate is wanted of £98, 8s. 9d.; what must be the assessment per £?

99. What does a tax of 7d. in the £ amount to on an income of £1285, 15s. 10d.? (Work by Practice.)

100. If 25 workmen can dig a trench 220 yards long, 3 ft. 4 in. wide, and 2 ft. 6 in. deep, in 32 days, when the day is 9 hours long, how many workmen would be able to dig a trench half a mile long, 2 ft. 4 in. deep, and 3 ft. 6 in. wide, in 36 days, when the day is 8 hours long?

METHOD OF UNITY.

If the income tax be 6d. in the £, what would a person pay who is assessed at £428, 10s.?

| | | |
|----------------------------|---|------------------------------|
| Tax on 20/ | = | 6d. |
| " 1/ | = | $\frac{3}{10}$ d. |
| " 8570/ | = | $\frac{3}{10} \times 8570$. |
| 3 857 | | |
| $\frac{3}{10} \times 8570$ | = | 2571d. |
| 20 | = | 214s. 3d. |
| 2 | = | £10, 14s. 3d. |

If 18 men build a wall in 10 days, how long will 24 men take to build it?

More men take less time.

$$\begin{aligned} \text{Time taken by 18 men} &= 10 \text{ days.} \\ \text{" " 1 man} &= 10 \text{ days} \times 18. \\ \text{" " 24 men} &= \frac{10 \times 18}{24} \text{ days.} \end{aligned}$$

$$\begin{array}{r} 5 \quad 3 \\ 10 \times 18 \\ \hline 24 \\ \hline 15 \\ 2 \\ \hline 7\frac{1}{2} \end{array} = \frac{5 \times 3}{2} = \frac{15}{2} = 7\frac{1}{2} \text{ days.}$$

If 20 men reap 30 acres of grain in 6 days, how many acres will 12 men reap in 8 days?

Number of acres reaped by

$$20 \text{ men in 6 days} = 30$$

$$1 \text{ man in 6 " } = 30$$

$$20$$

$$1 \text{ " 1 day} = 30$$

$$20 \times 6$$

$$12 \text{ men in 1 " } = 30 \times 12$$

$$20 \times 6$$

$$12 \text{ " 8 days} = 30 \times 12 \times 8$$

$$20 \times 6$$

$$\begin{array}{r} 8 \\ 30 \times 12 \times 8 \\ \hline 20 \times 6 \end{array} = 3 \times 8 = 24 \text{ acres.}$$

*CANDIDATES—FEMALES.***ARITHMETIC.**

1. Find, by Practice, the value of 320 articles at £1, 11s. 10½d. each.

2. What is the cost of 17 cwt. 3 qr. 21 lb., at £8, 13s. 4d. per ton?

3. Make out a bill for the following articles: 5 oz. of tea at 3s. 4d. per lb.; 7½ lb. of sugar at 5½d per lb.; 11¼ lb. of coffee at 1s. 2d. per lb.; 17½ lb. of candles at 7½d.

4. Find, by Practice, the value of 37 cwt. 3 qr. 17 lb. of coffee, at £8, 17s. 4d. per cwt.

5. Find, by Practice, the value of 2036 articles at £2, 13s. 8½d. each.

6. Make out a bill for the following articles: 12½ doz. of slates at 3d. each slate; 80 reading-books at 1s. 3d. each; 126 copies at 8d. per doz.; and 18 boxes of pens at 1s. 9d. each.

7. Find, by Practice, the value of 7031 articles at 14s. 6½d. each.

8. Find, by Practice, the value of 23 ac. 3 ro. 16 po., at 2½ guineas per acre.

9. Make out a bill for the following articles: 17 lb. of coffee at 10½d. per lb.; 15 lb. of sugar at 5¼d. per lb.; 3 pints of vinegar at 8s. 2d. per gallon; 16 lb. of salt at 1s. 9d. per cwt.

10. Find, by Practice, the value of 3061 articles at £2, 7s. 3½d. each.

11. Find, by Practice, the price of 50 packets, each 3 lb. $5\frac{1}{2}$ oz., at 3s. 4d. per lb.

12. Make out a bill for the following: $5\frac{1}{2}$ lb. at 9d. a pound; $3\frac{3}{4}$ lb. at 8d. a pound; 16 lb. 12 oz. at 8d. a pound; $14\frac{1}{4}$ lb. at 11d. a pound; $9\frac{3}{4}$ lb. at 7d. a pound; and $8\frac{1}{2}$ doz. eggs at 1s. 2d. a doz.

13. Find, by Practice, the value of 17 qr. 5 bush. 3 pk., at £2, 5s. per qr.

14. Find, by Practice, the cost of 462 articles at £2, 16s. 4d. each.

15. Make out a bill for the following: 30 articles at 15s. 8d. each; 72 articles at 19s. $11\frac{3}{4}$ d. each; 89 articles at £19, 10s. 6d. each; and 215 articles at $\frac{3}{4}$ d. each.

16. The cost of a yard of cloth is thirty-five shillings and a halfpenny; find, by Practice, the price of $682\frac{1}{2}$ yd.

17. What is the value of 10 fur. 30 po., at £15, 12s. 6d. per mile?

18. Make out in correct form a bill for

| | |
|-------------------------------|-------------------------------------|
| 200 boxes of tea, | at £30, 10s. for 20 boxes. |
| 2 doz. eggs, | " $9\frac{1}{2}$ d. per half-dozen. |
| 325 hats, | " 16s. $6\frac{1}{4}$ d. each. |
| $48\frac{1}{3}$ yd. of cloth, | " 4s. 11d. per yd. |
| A pair of stockings, | " 2s. 6d. per pair. |

19. Value, by Practice, the rent of 553 ac. 3 ro. 33 po., at £2, 13s. 4d. per acre.

20. Value, by Practice, 3546 articles at £1, 6s. $7\frac{3}{4}$ d. each.

21. Make out a bill for the following:

| | |
|-----------------|------------------------------|
| 116 yd. calico, | at $6\frac{1}{4}$ d. per yd. |
| 46 " cambric, | " 2s. $3\frac{1}{2}$ d. " |
| 19 " silk, | " 4s. $9\frac{3}{4}$ d. " |
| and 60 needles, | " $1\frac{1}{4}$ d. per doz. |

22. Find, by Practice, the value of eight thousand seven hundred and nine articles, at 16s. $0\frac{1}{2}$ d. each.

23. Make out a bill for

29 $\frac{1}{2}$ yd. cotton, at 4 $\frac{1}{2}$ d. per yd.
 168 buttons, " 1s. $0\frac{1}{2}$ d. per doz.
 42 towels, " 3s. $11\frac{1}{2}$ d. each.
 492 yd. of lace, " 10d. a yd.
 15 yd. of linen, " $\frac{3}{4}$ d. per quarter.

24. What is the worth of 37 cwt. 2 qr. 14 lb., at £7, 10s. 9d. per cwt.? (By Practice.)

25. Find, by Practice, the value of five tons five pounds of cotton, at £2, 6s. 8d. per cwt.

26. Find, by Practice, the value of seven thousand and fifty pencils, at 3s. $6\frac{1}{2}$ d. a hundred.

27. Make out in full a bill for the following: Silk for a dress, 19 yd., at 9s. $7\frac{1}{2}$ d. per yd.; lining for dress, $7\frac{1}{2}$ yd., at $10\frac{1}{2}$ d. per yd.; lace trimming, 33 yd., at 1s. $5\frac{1}{4}$ d. per yd.; buttons, 60, at $7\frac{1}{2}$ d. a dozen; and making dress, &c., £1, 7s. 6d.

28. Find, by Practice, the value of 1536 articles at £15, 16s. $6\frac{3}{4}$ d. each.

29. Value, by Practice, 3 tons 3 qr. 3 lb., at £1, 11s. 8d. per cwt.

30. Make out a bill for the following: $10\frac{1}{2}$ lb. of cheese at $10\frac{1}{2}$ d. per lb.; 1 qr. of tea at 3s. 4d. per lb.; 4 four-lb. boxes of biscuits at $8\frac{1}{2}$ d. per lb.; and $1\frac{1}{2}$ cwt. of sugar at $3\frac{1}{2}$ d. per lb.

31. What would 4115 $\frac{1}{2}$ articles come to at £3, 16s. $0\frac{1}{2}$ d. each?

32. How much would 6 fur. 29 po. amount to at £4, 12s. 8d. per mile?

33. Make out a bill in correct form for the following: 18 yd. of lace at 12s. 3d. per yd.; 5 pairs of kid gloves

at 2s. 2d. per pair; 4 doz. cuts of worsted at $8\frac{1}{2}$ d. per cut; $68\frac{3}{4}$ yd. of silk at 11s. $0\frac{1}{2}$ d. per yd.; 2 yd. 3 qr. of cotton at $10\frac{3}{4}$ d. per qr.

34. Find, by Practice, the value of 6 chests of tea, each weighing 1 cwt. 2 qr. 17 lb., at £19, 0s. 4d. per cwt.

35. Find, by Practice, the value of nine hundred and six sheep, at £1, 11s. $10\frac{1}{2}$ d. each.

36. Make out in full a bill for the following articles :

50 quires superfine note-paper, at $3\frac{1}{2}$ d. per quire.

129 " foolscap paper, at $5\frac{1}{2}$ d. per quire.

450 pencils, at 2s. $4\frac{1}{2}$ d. per hundred.

130 rulers, at $10\frac{1}{4}$ d. each.

37. Find the value of 750 oxen at $8\frac{1}{2}$ d. per lb., and 3500 sheep at $6\frac{1}{2}$ d., assuming 4 cwt. as the weight of an ox, and 12 stones as that of a sheep.

38. Reduce nine million forty thousand and 12 in. to miles, fur. po. &c.

39. Find the price of 4 tons 13 cwt. 2 qr. 21 lb., at £20, 8s. 8d. per cwt.

40. Find, by Practice, the rent of 876 ac. of land, at £4, 15s. $9\frac{1}{2}$ d. per ac.

41. Find, by Practice, the value of 17 lb. 7 dwt. 12 gr. of silver, at 5s. 6d. per oz.

42. Make out and properly receipt a bill for the following articles :

2 chests of tea, each containing 56 lb., at 2s. $7\frac{1}{2}$ d. per lb.
 $37\frac{1}{2}$ lb. of sugar, at $4\frac{1}{2}$ d. per lb.

5 stones $10\frac{1}{2}$ lb. of oatmeal, at 2s. 4d. per stone.

42 lb. of baking apples, at 1s. for 8 lb.

43. Find, by Practice, the cost of 638 articles at £5, 14s. $10\frac{1}{2}$ d. each.

44. Make out and properly receipt a bill for the following articles :

| | |
|--------------------------------|------------------------------------|
| 9 $\frac{3}{4}$ yd. of velvet, | at 12s. 4d. per yd. |
| 23 $\frac{1}{4}$ " of silk, | " 4s. 6d. per yd. |
| 17 " 2 qr. of calico, | " 8 $\frac{1}{2}$ d. per yd. ; and |
| 14 $\frac{1}{2}$ " of linen, | " 2s. 2 $\frac{1}{2}$ d. a yd. |

45. Find, by Practice, the price of 5 ac. 3 ro. 36 po., at £80, 10s. per ac.

46. Find, by Practice, the cost of 2 tons 9 cwt. 1 qr. 22 lb., at £3, 15s. 4d. per cwt.

47. Find, by Practice, the cost of 789 articles at £13, 19s. 8 $\frac{3}{4}$ d. each.

48. Make out and receipt, in business form, a bill for the following articles :

| | |
|------------------------------------|--------------------------------|
| 19 $\frac{1}{4}$ lb. of green tea, | at 4s. 6d. a lb. |
| 29 $\frac{3}{4}$ " sugar, | " 4d. per lb. |
| 55 $\frac{1}{2}$ " rice, | " 2 $\frac{1}{2}$ d. a lb. |
| 103 " indigo, | " 5s. 7 $\frac{3}{4}$ d. a lb. |
| 257 " soap, | " 5 $\frac{1}{4}$ d. a lb. |

49. Find, by Practice, the cost of 897 articles at £19, 17s. 9 $\frac{3}{4}$ d. each.

50. Find, by Practice, the cost of 3 tons 6 cwt. 2 qr. 17 lb., at 7s. per cwt.

51. How many lb. of sugar at 4d. per lb., should I receive for 18 lb. of tea at 2s. 8d. per lb.?

52. Find, by Practice, the value of 6043 lb. of tea at 3s. 2 $\frac{1}{2}$ d. a lb.

53. If sugar be bought at £1, 19s. 6d. a cwt., and retailed at 6 $\frac{1}{2}$ d. a lb., what is the profit on a cask containing 7 cwt. 1 qr. 14 lb.?

54. Make out and receipt the following bill :

| | |
|---------------------------------------|------------------------------|
| 73 ft. of stout pipe, | at $6\frac{1}{2}$ d. per ft. |
| 18 joints, | " 1s. 3d. each. |
| 37 pipe hooks, | " $1\frac{1}{2}$ d. each. |
| $157\frac{1}{2}$ yd. of wire fencing, | " 2s. 1d. per yd. |
| Time, 4 men, each 2 days, | " 3s. 6d. |

55. Find, by Practice, the cost of 1 ton 2 qr. 20 lb., at £9, 6s. 8d. per cwt.

56. Find, by Practice, the price of $4627\frac{1}{4}$, at 19s. 10d. each.

57. How many pounds of tea at 3s. 4d. per lb., ought I to receive for 340 lb. of sugar at $4\frac{3}{4}$ d. per lb. ?

58. Make out the following bill :

| | |
|--------------------------|-----------------------|
| 3 quarters of wheat, | at 7s. 9d. per bushel |
| 12 bushels of oats, | " 3s. 2d. " |
| 18 " barley, | " 4s. 10d. " |
| $25\frac{1}{2}$ " rye, | " 4s. 4d. " |
| $17\frac{1}{4}$ " beans, | " 4s. 10d. " |
| 28 " peas, | " 4s. 8d. " |

59. How much brass, at 1s. 3d. per lb., ought to be given for 98,600 nails at $6\frac{1}{2}$ d. per hundred ?

60. Find, by Practice, the value of $2037\frac{1}{2}$ cwt. of sugar, at £1, 19s. $8\frac{1}{2}$ d. a cwt.

61. Find the value of a crop on 12 ac. 1 ro. 22 poles, at £19, 6s. 8d. an acre.

62. Reduce 28,635 seconds to hours.

63. Reduce 15 years 70 days to half-hours.

64. Make out the following bill :

| | |
|-------------------|---|
| 27 pieces cotton, | 540 yd., at 1s. $1\frac{1}{4}$ d. per yd. |
| 13 " " | 390 " 1s. $3\frac{3}{4}$ d. " |
| 23 " muslin, | 920 " 3s. $7\frac{1}{2}$ d. " |
| 25 " " | 1000 " 2s. $11\frac{3}{4}$ d. " |
| 17 " nankeens, | 510 " 3s. $2\frac{1}{4}$ d. " |
| 37 " silk, | 1110 " 3s. $6\frac{3}{4}$ d. " |

65. Make out and receipt the following bill :

| | | |
|-------------------|----|------------------|
| 73 yards of silk, | at | 14s. 3d. per yd. |
| 25 " lawn, | " | 2s. 6d. " |
| 31 " cambric, | " | 5s. 3½d. " |
| 86 " velvet, | " | £1, 4s. 9¾d. " |
| 75 " lace, | " | 12s. 3½d. " |
| 19 " brocade, | " | 16s. 9d. " |

66. Find the price of 3952 ac., at £3, 11s. 5¼d. each.

67. Find, by Practice, the value of 2166 tons, at 6s. 9¾d. per ton.

68. What is the cost of 272 cwt. 1 qr. 21 lb., at £3, 2s. 3¾d. per cwt. ?

69. What is the cost of 456⅝ cwt., at 16s. 8¾d. per cwt. ?

70. Make out and receipt the following bill :

| | | |
|------------------------|----|--------------|
| ½ cwt. cheese, | at | 7¾d. per lb. |
| 127 lb. bacon, | " | 6½d. " |
| 40 " fresh butter, | " | 1s. 2½d. " |
| 20 " salt butter, | " | 9d. " |
| 19½ " lard, | " | 7d. " |
| 120 eggs, | " | 9d. per doz. |

71. Make out the following bill :

| | | |
|---------------------------|----|--------------|
| 19½ lb. | at | 7¾d. per lb. |
| 7 " | " | 7½d. " |
| 13½ " | " | 8d. " |
| 19 " | " | 7½d. " |
| 3 articles, each 22½ lb., | " | 6½d. " |
| 10½ lb. | " | 7½d. " |

72. A grocer's bill amounts to £189, 15s. It happens to be made up of equal sums for tea at 3s. 10d. a lb., sugar at 6d. a lb., rice at 4½d. a lb., and coffee at 1s. 3d. a lb. How many lbs. are there of each sort ?

73. $1832\frac{5}{16}$ yd., at 16s. $8\frac{3}{4}$ d. (By Practice.)

74. Find the cost of 723 ft. 11 in., at 3s. $2\frac{1}{2}$ d. per foot.

75. How much is the following bill?

12 bars, each $3\frac{1}{2}$ lbs., at $5\frac{1}{2}$ d. per lb.

164 lb., at 30s. per doz. lb.

12 packets, each $6\frac{1}{2}$ lb., at $11\frac{1}{2}$ d. per lb.

76. Make out and receipt the following :

11 lb. at 3s. 2d. per lb.

$9\frac{1}{2}$ oz. " 16d. per oz.

9 yd. " $3\frac{3}{4}$ d. per yd.

6 lb. " $7\frac{1}{2}$ d. per lb.

10 oz. " $9\frac{1}{4}$ d. per oz.

3 doz. and a half, at 6 for 7d.

77. $987\frac{3}{16}$ yd. at 24s. per yd. How much?

78. $2721\frac{1}{2}$ tons at £35, 12s. $10\frac{1}{2}$ d. each. How much?

79. Find the cost of 11 ro. 7 po., at £17, 2s. 1d. per acre.
(By Practice.)

80. Find, by Practice, the cost of 8 qr. 5 bush. 3 pk.
1 gall., at £14, 13s. 4d. per qr.

81. Write out an invoice for :

17 articles, at $7\frac{3}{4}$ d. each.

9 " " 2s. $7\frac{1}{2}$ d. "

1 article, " half a guinea.

19 articles, " 1s. $10\frac{1}{2}$ d. each.

82. Make out a bill for :

24 things, at 52s. 6d. each.

75 " " 40s. "

27 " " 33s. "

13 " " 43s. "

52 " " 25s. 6d. "

70 " " 28s. 9d. "

83. Find, by Practice, the rent of a farm containing
115 ac. 3 ro. 25 po., at the rate of £4, 10s. an acre.

84. Find, by Practice, the price of 15 yd. 3 qr. 1 nl. of velvet, at the rate of 11s. $4\frac{1}{2}$ d. per quarter.

85. Make out, and receipt in proper form, a bill for 1000 envelopes at $6\frac{1}{2}$ d. per 100; 56 reams of paper at 7s. 9d. per ream; 13 quires of blotting-paper at $10\frac{1}{2}$ d. per quire; 9 dozen black-lead pencils at 2s. 11d. per dozen.

86. Find, by Practice, the price of 249 articles at £2, 13s. 9d. each.

87. Find, by Practice, the price of 33 cwt. 3 qr. 7 lb., at the rate of £6, 7s. 8d. per cwt.

88. Make out in proper form, and receipt the following bill: $18\frac{1}{2}$ yd. of cloth at £1, 10s. per yd.; 14 yd. of rich velvet at 18s. $11\frac{1}{4}$ d. per yd.; $37\frac{1}{4}$ yd. of calico at 1s. 10d. per yd.; and $112\frac{3}{4}$ yd. of silk at 3s. 6d. per yd.

89. Find, by Practice, the price of 15 oz. 6 dwt. 17 gr. of silver, at the rate of 5s. 10d. per oz.

90. Find, by Practice, the rent of a farm containing 30 ac. 3 ro. 20 po., at the rate of £2, 10s. 6d. an acre.

91. Make out, and receipt in proper form, a bill for the following articles: 36 lb. of soap at $10\frac{1}{2}$ d. per lb.; 39 lb. of butter at $8\frac{3}{4}$ d. per lb.; 24 lb. of lump-sugar at $7\frac{1}{4}$ d. per lb.; $6\frac{1}{2}$ lb. of starch at 1s. 2d. per lb.; $22\frac{1}{2}$ lb. of tea at 4s. 6d. per lb.

92. Value, by Practice, 327 articles at 5s. $3\frac{1}{4}$ d. $\frac{3}{8}$ each.

93. Value 15 tons 4 cwt. 3 qr. 21 lb., at £11, 17s. 6d. per ton.

94. Find the value of 7857 articles at £1, 9s. $1\frac{1}{2}$ d. a score.

95. The cost of 2 tons 4 cwt. 1 qr. $3\frac{1}{2}$ lb., at £7, 9s. $4\frac{1}{2}$ d. per cwt.

96. If a man earn regularly 8s. $5\frac{1}{4}$ d. a day, in how many days will he earn £10, 2s. 6d.?

97. Find, by Practice, the cost of 9086 articles at 12s. $11\frac{3}{4}$ d. each.

98. Make out the following bill, with proper heading and receipt: $3\frac{1}{2}$ lb. coffee at 1s. 10d.; 3 qt. vinegar at 2d. per pt.; 1 bar of soap, weighing $35\frac{1}{2}$ lb., at $3\frac{1}{2}$ d. per lb.; 3 doz. eggs at $\frac{3}{4}$ d. each.

99. Find, by Practice, the cost of 3864 articles at $2\frac{1}{2}$ d. each.

100. Find the value of 9 ac. 3 ro. 20 po., at £5, 5s. per rood. (Work by Practice.)

CANDIDATES—MALES AND FEMALES.

DICTION.

A short passage of prose to be selected by the Inspector, read over once, and then slowly dictated.

CANDIDATES—MALES AND FEMALES.

GRAMMAR.

1. Parse the words in Italics in the following passage:

'*All honest thinking men must lament to see their country run headlong into all these luxurious follies, which, it is evident, have been fatal to other nations, and will undoubtedly prove fatal to us also, if a timely stop be not put to them.*'

2. Mention any adjectives having more than one superlative form.

3. Define *intransitive, irregular, impersonal, and auxiliary* verbs, giving examples.

4. Parse the words in Italics in the following passage, showing their relations:

'It was at Rome, on the 15th of October 1764, as I sat musing amidst the ruins of the Capitol, while the barefooted friars were singing vespers in the temple of Jupiter, that the idea of writing the decline and fall of the city first started to my mind.'

5. What is meant by *mood*? Mention the different moods, and say what each is used to denote.

6. Name some nouns with the same form in both numbers, and some with two plural forms.

7. Parse the words in Italics in the following passage, showing their relations :

'Nothing more disastrous could have occurred to the savage portion of *brute* creation than the invention of gunpowder, and this remark *applies* especially to the elephant and *other* large animals, whose tenacity of life is almost as *remarkable* as their enormous size.'

8. Mention and compare six adjectives of irregular comparison.

9. State, with examples, the exceptional rules for the formation of plural nouns.

10. Parse fully the words in Italics in the following passage :

'Other parts of the region are bare and *desolate* as a *desert*. Here the air is *bracing*, and *imparts* a remarkable exhilaration to both body and mind ; in *another* place it is so *mixed* with the vapours of salt, soda, *sulphur*, and other *minerals*, that depression of spirits cannot be *escaped*.'

11. Give examples, *four* of each, of (1) nouns that form the plural, and (2) verbs that form the past tense and past participle by change of vowel.

12. What is the use of the superlative degree of adjectives? Compare *wealthy*, *wrong*, *gay*, *late*, *old*.

13. Select the adjectives in the following passage, and state in regard to each (a) its class, and (b) the noun it qualifies :

'The next day (9th December 1874) *was* intensely pure, one of those incomparable *bites* of California winter, warm, balmy, and full of bright sparkling sunshine, and at the same time enlivened with *one* of the most cordial wind-storms conceivable. I *lost* no time in *pushing out* to the woods to *enjoy* it.'

14. Parse fully the words in *Italics* in the above passage.

15. What is the difference between proper nouns and common nouns? When are proper nouns used in the plural? Give *four* examples of such usage.

16. Give the general rule for the formation of the plural of nouns, and enumerate the principal exceptions to it.

17. Parse, with syntax, the nouns, adjectives, and verbs in the following passage :

‘Stone walls do not a prison make,
Nor iron bars a cage ;
A free and quiet mind can take
These for a heritage.’

18. Parse the words in *Italics* in the following passage, showing their relations :

‘It was a little *hamlet* which *straggled* along the side of a creek *formed* by the discharge of a small brook into the sea, and was hidden from the castle, to which it *had been* in former times an *appendage*, by the intervention of the shoulder of a hill *forming* a *projecting headland*. It was called *Wolfe’s Hope*.’

19. Give a classification of adjectives, illustrating it as far as possible by examples from the above passage.

20. Explain the terms ‘mood,’ ‘tense,’ ‘transitive,’ ‘intransitive,’ and show that the same verb may be sometimes transitive, sometimes intransitive, according to the sense in which it is used.

21. Parse fully the words in *Italics* in the following lines :

‘‘*Tis good to speak in kindly guise,*
And *soothe* where’er we *can* ;
Fair speech should bind the human mind,
And love *link* man to man.’

22. Give the plural of *portico*, *leaf*, *sheaf*, *wharf*, *serf*, *phenomenon*, *crisis*, *index*, *Mussulman*.

23. Parse, with syntax, the nouns, verbs, and adjectives in the following lines :

‘Dark night, that from the eye his function takes,
The ear more quick of apprehension makes ;
Wherein it doth impair the seeing sense,
It pays the hearing double recompense.’

24. Give the plural of the following nouns: *Tyro, potato, die, scarf, wharf.*

25. Parse fully, with special attention to their relations, the words in Italics in the following passage :

‘Yet *all* the *objects* which met the eye and *filled* in the *view* were *appropriate*. There *were* picturesque boats and palm-trees on the *farther* shore, and over them were the gray *Pyramids* *rearing* their heads a few *miles* off.’

26. Explain clearly what is meant by ‘collective’ and ‘proper’ nouns. Give two examples of each kind.

27. Explain what is meant by the ‘mood,’ ‘tense,’ and ‘person’ of a verb.

28. Parse, with syntax, the words in Italics in the following lines :

‘The red *bird* *warbled* as he *wrought*
His hanging nest *o’erhead*,
And *fearless* near the fatal *spot*
Her *young* the *partridge* *led*.’

29. Give the feminine of *hero, proprietor, earl, marquis, sultan, negro, bachelor.*

30. Parse fully, with special attention to their relations in the following passage, the words in Italics :

‘If we *were* to attempt to enumerate *all* the *sugar-producing* plants, we might almost go on to *infinity*. Sugar *is* contained more or less in the stem of the sorghum, and in the green stalks of the *Indian* corn or *maize*.’

31. Explain ‘passive voice.’ What class of verbs cannot be used in the passive voice ?

32. Give rules for the regular comparison of adjectives, and compare *sad, merry, gay, wonderful, cruel, many, pleasant*.

33. Parse the words in Italics in the following passage :

'I stood checked for a moment; awe, not fear, fell upon me; and whilst I stood, a solemn wind began to blow—the saddest that ear ever heard. It was a wind that might have swept the fields of mortality for a thousand centuries.'

34. Give examples of nouns (1) that form their plural by vowel change; (2) that have two plural forms, each with a different signification; (3) nouns that are used only in the plural. (4) Give the plural of *phenomenon, radius, species, index, formula*.

35. Give the past tense and past participle of *shake, drive, bite, show, see, saw, do*.

36. Parse fully the words in Italics in the following passage :

'The more rude and wild the state of society, the more general and violent is the impulse received from poetry and music. The muse, whose effusions are the amusement of a very small part of a polished nation, records, in the lays of inspiration, the history, the laws, the very religion of savages.'

37. What other parts of speech are sometimes employed as adjectives? Illustrate by examples.

38. Explain the terms 'strong' and 'weak' as applied to verbs. Classify under these heads the following verbs : *Cut, do, walk, teach, hear, run*.

39. Parse the words in Italics in the following passage :

'Like most men, as he grew more selfish, he was tolerably successful in deceiving himself as to his own motives and state of mind.'

40. Explain the differences of meaning between the two plural forms of *cloth, brother, genius*.

41. Conjugate *slay, weave, bid, spring, do, am*.

42. Parse the words in *Italics* in the following passage :

‘*All night*
The plunging seas drew backward from the land,
Their moon-led waters white.’

43. State the exceptions to the general rule for the formation of the plural of nouns.

44. Give the rules for comparison of adjectives, and compare *fore, old, bad, gay, dry, good, extraordinary, and happy.*

45. Parse the words in *Italics* in the following passage :

‘*Many* a good ship *has* lost *that* tide which *might* have led to fortune, because it was *thought* *unlucky* to begin the voyage on a *Friday.*’

46. Classify the following adjectives : *Bright, few, much, four, fourth, yon, each, English.*

47. Give short sentences illustrating the uses of (a) the infinitive, (b) the participle.

48. Mention the various classes of nouns, and give examples of each.

49. What are the most common terminations of *abstract* nouns, and of *verbal* nouns?

50. What is meant by degrees of comparison? Give the other degrees of *better, next, bad, happy, true, square, extraordinary.*

51. Parse the words in *Italics* in the following passage :

‘*The taste* of the English in the *cultivation* of land, and in what is called *landscape gardening, is unrivalled.* They *have studied* nature intently, and *discovered* an *exquisite* sense of her beautiful *forms* and *harmonious combinations.*’

52. Parse the words in *Italics* in the following passage :

‘*For some* time after his elevation, he *showed* himself a *little wanting* in that wariness and *self-command, to which, more than even to his transcendent talents, his elevation was to be ascribed.*’

53. How do nouns that end in *x* form the plural? Give an example and an exception.

54. Compare *old, near, hind, out, and up.*
 55. Give the past tense and past participle of 'drive,' 'strive,' 'arrive,' 'weave,' 'cleave,' and 'leave.'

SPECIMENS OF ANALYSIS.

'Who are you?'

Subject.....'you.'

Predicate... { Verb of incomplete predication.....'are.'
 { Complement of subject.....'Who?'

'Having examined the whole regiment, the enraged officer struck the guilty man dead with a single blow of his sword.'

Subject.....'officer.'

Attributes { (a) 'the'
of Subject { (b) 'enraged',
 { (c) 'Having examined the whole regiment.'

Predicate { Verb of incomplete predication.....'struck.'
 { Objective completion.....'dead.'

Object.....'man.'

Attributes { 'the'

of Object { 'unfortunate.'

Adverbial extension } 'with a single blow of his sword' (manner).
of Predicate. }

'It is I.'

Subject.....'It.'

Predicate { Verb of incomplete predication.....'is'
consisting of { Completion of Subject.....'I.'

CANDIDATES—MALES AND FEMALES.**GEOGRAPHY.**

1. Mention, in order from north to south, the counties on the east coast of Great Britain.
2. Describe the position of Swansea, Birkenhead, Dover, Leith, Alloa, Crieff, Cork.
3. Mention the chief rivers and the chief seaports of Ireland.
4. Name the order and position of the capes between the mouth of the Humber and Cape Wrath.
5. What is a *roadstead*, an *isthmus*, a *strait*, a *river*, a *river-basin*, and a *watershed*? Give examples of each.
6. Name the chief mountains in Ireland, with the counties in which they are situated.
7. Mention the places in England where the manufacture of iron, silk, and cotton is carried on.
8. Where are the following places, and for what are they noted: Preston, Jedburgh, Limerick, Wick, Leeds, Canterbury, and Portsmouth?
9. Name and give the position of the principal fresh-water lakes of Scotland.
10. Describe a *voyage* round the north of Scotland from Wick to Glasgow, mentioning the chief physical features that might be seen.
11. Name, in order from north to south, the chief British rivers that flow into the German Ocean.
12. In which counties are the following places, and for what are they noted: Chichester, Southampton, Leicester, *Kirkcaldy*, Belfast, Port-Glasgow, Elgin?

13. Give a short account of the English lakes.
14. Mention as many British towns as you can, engaged in the iron trade?
15. Where and what are the Minch, Skerryvore, Eddystone, Woolwich, the Witham, Loch Corrib, Lough Foyle, the Needles, and Scarborough?
16. What counties are drained by the Forth, and what by the Tweed?
17. Name towns in Great Britain famous for the manufacture of silk, cotton, lace, muslins, iron, earthenware.
18. Where, and for what noted are: Staffa, Llandaff, Barrow-in-Furness, Loch Lomond, Snowdon?
19. Name the capes on the south coast of England, mentioning where they are situated, and anything of note respecting them.
20. Give, in order of importance, the chief commercial ports in England, Scotland, and Ireland.
21. Where are Colchester, Lough Neagh, Stonehaven, Pass of Glencoe, Killarney, Whitby? Say what you know about them.
22. In what counties and at what places are the following to be found: Woollen manufactures, lead mines, hops, hosiery, stoneware?
23. Name in order the counties of Ireland on the east coast.
24. Describe the position of the following, and tell what you know about them: Isle of Man, Cardiff, Grangemouth, Kilkenny, Bristol, Iona, Sligo.
25. Name the principal lakes in Scotland, showing their connection with the river system, and mentioning any facts you know about them.
26. Name places in Scotland and England where the manufacture of iron is carried on.

27. Where are the following towns, and for what noted : Sanquhar, Hawick, Beaul, Harwich, Hull, Bristol, Winchester, Enniskillen, Limerick, Drogheda, and Londonderry ?

28. What are the chief mineral productions of Scotland, and where are they worked ?

29. Enumerate the English rivers that flow into the Irish Sea, with the towns situated on them.

30. State where the following places are situated, and for what they are remarkable : Falkirk, Iona, Giant's Causeway, Rochdale, Sheffield, Matlock, Moffat, Brighton, and Nairn.

31. Give an account of the Orkney and Shetland Islands, naming the chief islands and towns, and stating what you know of the natural features and chief industries.

32. In what counties is the Lake District of England situated ? Name the principal lakes, and the towns in their vicinity.

33. State the situation of the following towns, and say for what they are noted : Stoke-upon-Trent, Penzance, Southampton, Cheltenham, Greenock, Fort Augustus, Kirkcaldy, Arbroath, Belfast, Coleraine, Youghal, and Galway.

34. Name the principal towns of the counties that border on the Bristol Channel.

35. Tell the exact positions of the counties of Renfrew and Elgin, name the important towns in them, and say for what they are noted.

36. State what you know of Lifford, Tralee, Clonmel, Cashel, Tuam, Trim, Maynooth.

37. Name in order the *capes*, *bays*, and *river mouths* on the west coast of England and Wales.

38. Name the chief seaports of Scotland, and describe their situations.

39. Where, and for what noted, are Hull, Truro, Cork, *Peterborough*, *Limerick*, *St Helier*, *Bangor* ?

40. Name in order the counties on the west coast of Ireland, with the county town of each.

41. Describe exactly the position of the county of Warwick; give the important towns in it; and say for what each is noted.

42. Where, and for what noted, are Musselburgh, Dornoch, Cromarty, Montrose, Lerwick, St Kilda, Paisley?

43. Where are Dundee, Bannockburn, Barrow-in-Furness, and Coventry; and what industries are connected with them?

44. By how many routes might a coasting vessel sail from Glasgow to Newcastle, and what reason might guide the captain in choosing among them?

45. Where are the chief lakes and mountain ranges in Ireland and England?

46. Name the rivers of England that fall into the German Ocean, beginning at the north.

47. Name the chief lakes in Scotland, and the counties in which they are situated.

48. Assign to their respective counties the following towns: Belfast, Dundalk, Manchester, Glasgow, Sunderland, Bristol, Peterhead, and Plymouth.

49. Where are the chief seats of the woollen, hardware, silk, and pottery manufactures? Can any reasons be given for their distribution over the United Kingdom?

50. From and to what towns are the chief trading routes between Great Britain and Ireland? Do you know of any lighthouses on either coast?

51. Name, in order, beginning at the north, the rivers of Scotland that fall into the German Ocean.

52. Sketch a map of Italy, and mark the positions of the principal towns, rivers, and mountains.

53. Describe, in words, the course of the Elbe, naming its chief tributaries, and more important towns in its basin.

54. Tell what you know of Stockholm, Croatia, the Douro, Archangel, the Platten See, Berlin, Cherbourg, the Sound, Heligoland, and the Faroe Islands.

55. Name the principal fresh-water lochs of Scotland, and the counties in which they are situated, and the firths on the east coast of Scotland.

56. On what rivers, and in what counties, are the following towns: Belfast, Drogheda, Liverpool, Glasgow, Bristol, Dundee, Kelso, and Carlisle?

57. Describe, in words, the course of the Severn, naming its chief tributaries.

CANDIDATES—MALES AND FEMALES.

HISTORY.

1. Which were the leading events, with dates, of the reign of James V.?

2. Mention the Scottish sovereigns who died in captivity or in battle.

3. Who succeeded the following sovereigns: James I., David II., and Robert III.? Write a short account of James IV.

4. Give the causes, dates, and results of the English expeditions into Scotland during the fourteenth century.

5. Give a short account of the contest between the kingdom of Scotland and the Lords of the Isles.

6. Name the sovereigns in their order, and with dates, who ruled over Scotland during the fourteenth century. Write a short account of the last.

7. Name, with dates, all the Scottish sovereigns who were imprisoned before they ascended the throne. Write a *short account* of any one of them.

8. Connect events with the following dates: 1306, 1307, 1329, 1406, 1437, 1552. Give particulars of one of them.

9. Give a short account of the principal events of the reign of David II.

10. Name, with dates, all the Scottish regents.

11. Mention the chief events, with dates, in the reign of James III.

12. Describe the career of Mary after Carberry Hill.

13. Mention the chief events, with dates, in the reign of James I.

14. When, and between whom, and with what results, were these battles fought: Halidon Hill, Homildon Hill, Sauchieburn, and Flodden.

15. Give a short account of the regents in James V.'s reign.

16. Give a list of five of the principal Scottish fortresses, and mention, with dates, any sieges or other events connected with them.

17. What was the cause of the rising in favour of Edward Baliol in the reign of David II.? Mention the battles fought, with their dates and results.

18. What is meant by a Border raid? Who were the Borderers, and what sort of life did they lead?

19. What was the end of the Regent Murray? Give with dates, a list and short account of the regents who succeeded him.

20. Tell what you know of the following: Lords of the Congregation, Gowrie Conspiracy, Kirk-of-Field, Rizzio, George Wishart, Bell-the-Cat.

21. How was the Scottish kingdom enlarged in the reign of James III.?

22. What treaty was concluded in 1328? What is meant by the statement that by that treaty the English king renounced for ever the claim of superiority?

23. What quarrels arose between the Scotch and King Henry VIII. in Queen Mary's reign ?

24. In what reigns do we hear of the Dukes of Albany, and with what events are they connected ?

25. What do you know about Oliver Sinclair, Black Agnes, Cardinal Beaton, Hal o' the Wynd, and Sir Andrew Barton ?

26. Narrate the circumstances connected with the murder of Lord Darnley.

27. Give some account of the troubles with the House of Douglas in the reign of James II.

28. 'James backed the cause of that mock prince Warbeck, that Flemish counterfeit.' State which James is referred to in these lines, and give an explanation of them.

29. Give, with date, the origin and result of the battle of Sauchieburn.

30. What was the date of the battle of Harlaw ? What made that battle so important ?

31. Give an account of the various regents during the minority of James VI.

32. Give a short account of the battle of Bannockburn, with the date.

33. Explain how differences arose with England on the death of James V.

34. Why had Elizabeth and her ministers such influence over Scottish affairs during the minority of James VI. ?

35. State the leading events in the early career of Robert the Bruce, and give the date of his death.

36. State what you know of the fortunes of the House of Douglas in the reign of James II.

37. Give a short account of the events for which the years 1314, 1346, 1513, and 1603 are memorable in the *history of Scotland*.

38. Why did the nobles rebel against James III. ? Give a short account of the battle of Sauchieburn, with the date.

39. What events are connected with the following dates : 1314, 1411, 1460, 1513, and 1542 ? Give particulars regarding the *first* and *fourth*.

40. Name the successive regents during the minority of James VI. Give particulars regarding the *first*.

41. Select any three of the following, and describe shortly the historical events connected with them. Give in each case the date : Marston Moor, Magnus Moor, Sedgemoor, Blenheim, Bunker's Hill, Vinegar Hill, Trafalgar.

42. Explain the following terms : Cavaliers, Roundheads, Ship-money, National Covenant, Self-denying Ordinance, Habeas Corpus Act, Septennial Act. Give dates.

43. State what you know of the circumstances attending the deaths of the first Duke of Rothesay, the second Duke of Albany, Lord Darnley, and the Regent Murray. Give the dates.

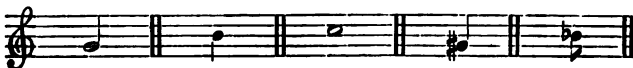
44. Give the events connected with the following dates : 1306, 1329, 1346, 1411, and 1488.

CANDIDATES—MALES AND FEMALES.

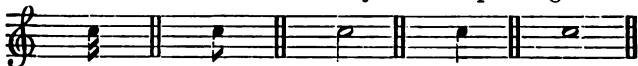
MUSIC.

Music is an optional paper for which a quarter of an hour is allowed, and special marks are given. Three or four of the papers which have been set are here given as samples of the nature of the examination.

1. Write over each of the following notes its pitch-name (C, D, *do*, *re*, or other), and under each its duration-name (crotchet, quaver, or other) :



2. Follow each of these notes by its corresponding rest :

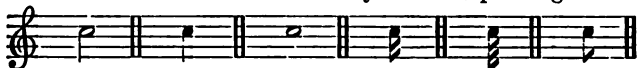


3. How many beats are there in a bar of time marked $\frac{6}{8}$?
What is the value of each beat ?

4. Write over each of the following notes its pitch-name (C, D, *do*, *re*, or other), and under each its duration-name (crotchet, quaver, or other) :



5. Follow each of these notes by its corresponding rest :



6. Supposing we make one beat while we sing a quaver, how many shall we make while we observe a minim rest and a crotchet rest ?

7. Write over each of the following notes its pitch-name (C, D, *do*, *re*, or other), and under each its duration-name (crotchet, quaver, or other) :



8. Follow each of these notes by its corresponding rest :



9. Supposing we make one beat while we sing a crotchet, how many shall we make while we observe a semibreve rest ?

10. Write below each of the following notes its pitch-name (C or *do*, &c.) :



11. Write against each of the following the answer required :

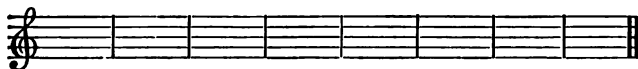
- (1) How many semiquavers are equal to a minim ?
- (2) How many quavers are equal to a semibreve ?
- (3) How many crotchets are equal to a semibreve ?
- (4) How many demi-semiquavers are equal to a minim ?

12. Write on the following stave,

- (1) A minim followed by its corresponding rest.
- (2) A quaver " "
- (3) A semibreve " "
- (4) A crotchet " "



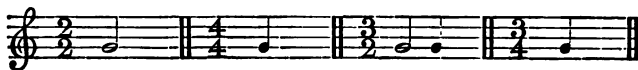
13. Write down the following notes : C (*do*), F (*fa*), B (*si*), E (*mi*), A (*la*), D (*re*), G (*sol*), C (*do*), as semibreves :



14. Write against each of the following the answer required :

- (1) How many semiquavers are equal to a crotchet ?
- (2) How many quavers are equal to a minim ?
- (3) How many crotchets are equal to a semibreve ?
- (4) How many demi-semiquavers are equal to a quaver ?

15. Fill up each of the following bars with the rests required to complete them :



PUPIL-TEACHER EXAMINATION PAPERS.

END OF THE FIRST YEAR—MALES.

ARITHMETIC.

1. Divide 4.1825 by .128, and express $1\frac{1}{8}$ of 10s. 6d. as the decimal of 13s. 4d.

2. If an ounce of gold be worth £4.0099, what is the value of a bar of gold weighing 8.416 lb.?

3. Simplify $\frac{1}{3\frac{1}{3}} - \frac{2\frac{1}{4}}{9} + \frac{3\frac{5}{8}}{2} + \frac{4}{4\frac{1}{7}}$

4. Find the value of $\frac{2}{5}(6\frac{2}{3} + 2\frac{1}{2})$ of £1 + $\frac{2\frac{1}{4} - \frac{2}{3}}{\frac{1}{5} \text{ of } 3\frac{1}{3} + \frac{1}{3}\frac{3}{8}}$ of $\frac{1}{2}\frac{9}{10}$ of a crown.

5. A person owns $\frac{3}{5}$ of a ship, and sells $\frac{3}{4}$ of his share for £171. What is the whole ship worth?

6. Reduce 7s. 6d. to the decimal of £5; and subtract 3.34 of an hour from .04 of a week.

7. What decimal of £1 is .0625 of 2 guineas? and what fraction of £1 is $\frac{2}{3}$ of 5s. 7 $\frac{1}{2}$ d.?

8. If $1\frac{3}{4}$ yd. of cloth cost 10s. 6d., express the price of $75\frac{5}{8}$ yd. as the fraction of £28.14.

9. Explain the meaning of a fraction such as $\frac{7}{8}$, and give the rule for adding fractions together. Which is greater, $\frac{1}{7}$ of 8, or $\frac{1}{8}$ of 9, and by how much?

10. If $\frac{3}{7}$ of $\frac{2}{3}$ of a meadow measure 3 ac. 0 ro. $11\frac{1}{2}$ po., what will $\frac{1}{10}$ of the remainder measure?

11. Divide $\frac{2\frac{1}{2} + 1.6}{3\frac{2}{3} - 2.5}$ by $\frac{.31}{1.68}$

12. A coal-merchant gives 10 tons 10 cwt. of coals, and pays £12, 19s. in exchange for 6 tons 10 cwt. of meal at £3, 17s. a ton; what ought to be the price of a ton of the coals?

13. What is the meaning of the expressions 'Greatest Common Measure' and 'Least Common Multiple?' How is the G.C.M. of two or more numbers found?

14. Divide .121 by 11, by 110, by .0011.

15. Simplify, and express the result as a decimal:

$$1 + \frac{1}{2 + \frac{1}{3 + \frac{1}{4}}}$$

16. If $\frac{2}{3}$ of an ounce cost $\frac{7}{8}$ of a shilling, what will $\frac{5}{8}$ of a lb. cost?

17. Simplify the following vulgar fraction, and give the answer in decimal form: $\frac{12\frac{6}{7}}{3\frac{2}{14}}$ of $\left(\frac{\frac{3}{7} + \frac{1}{9}}{\frac{3}{7} - \frac{1}{9}}\right)$

18. Write these fractions in decimal form, and in order of magnitude, putting the greatest first: $\frac{2}{3}$, $5\frac{4}{9}$, $\frac{188}{11}$, $2\frac{1}{19}$, $\frac{8}{2\frac{1}{2}}$.

19. Reduce .45 of 2 tons 2.75 cwt. to the decimal of 7 lb.

20. Add together $\frac{5}{6}$ of 7, $\frac{6}{7}$ of 8, $\frac{7}{8}$ of 9, and $\frac{8}{9}$ of 10.

21. What fraction of $37\frac{1}{27}$ is $27\frac{1}{27}$?

22. Divide 6.891 by 15.45.

23. Divide 4.714285 by 2.75.

24. Find the difference between

$$\frac{3\frac{5}{6} - (\frac{5}{6} + \frac{3}{4})}{3\frac{5}{6} - (\frac{5}{6} - \frac{3}{4})} \text{ and } \frac{3\frac{5}{6} - \frac{5}{6} + \frac{3}{4}}{3\frac{5}{6} - \frac{5}{6} - \frac{3}{4}}$$

25. From £.7415625 deduct 4.33125 shillings, and give the result as the decimal of a guinea.

26. If half a stone cost half a crown, what part of a ton can I buy for eightpence?

27. From $15\cdot34\dot{3}$ take $5\cdot24\dot{3}\dot{3}$, and to the remainder add $5\cdot24\dot{3}$.

28. Simplify $\frac{7\frac{1}{2} \times \frac{1}{8} \text{ of } \frac{4}{9}}{13\frac{5}{12} - 12\frac{7}{9}}$

29. Add together $\frac{5}{8}$ of a guinea, $\frac{3}{7}$ of a £, and $\frac{4}{5}$ of a shilling, and reduce their sum to the fraction of 13s. 6d.

30. Reduce $\cdot435 \div 7\cdot0035$ of $2\frac{1}{2}$ cwt. to the decimal of half a ton.

31. A can do a work in 6 days and B in 8 days; in what time will they do it working together?

32. Add together the difference between $3\frac{3}{4}$ and $4\frac{1}{2}$, the product of $4\frac{1}{4}$ and $5\frac{1}{5}$, and the quotient of $5\frac{1}{5}$ by $2\frac{1}{8}$.

33. If $\cdot17$ lb. cost $\cdot425$ of a penny, find the value of $\cdot45$ of a ton.

34. If I walk $5\frac{1}{8}$ yd. in $3\frac{1}{2}$ seconds, what part of 50 miles do I walk in half an hour?

35. Find the value of $\cdot43\dot{7}\dot{5}$ of a ton.

36. Express $\frac{1}{10 + \frac{1}{2 + \frac{1}{3\dot{6}}}}$ under form of a decimal.

37. Give the value of $4\cdot25$ hours - $3\cdot75$ of 45 min.

38. Divide 0.3 by $\cdot00006$, and from the quotient take $\cdot04$.

39. A captain and 160 sailors had a prize divided amongst them. The captain, whose portion was worth £450, received $\frac{3}{8}$ of the prize, and the remainder was divided equally amongst the sailors. Find the value of the prize, and the share of a sailor.

40. What fraction multiplied by $\frac{3}{7}$ of $6\frac{1}{2}$ will give $2\frac{1}{3}\dot{7}$?

41. Reduce $\cdot8$ of $\frac{3}{7}$ of 15s. $7\frac{1}{2}$ d. to the fraction of half a guinea.

42. If 3.5625 lb. of tea cost £.675, what, at the same rate, should be paid for a chest of tea weighing 1 cwt. 1 qr. 12 lb.?

43. Find the value of .04375 ton + .3125 cwt. - .15625 lb.

44. Multiply £563, 7s. 9½d. by 1674.

45. If 7 men can mow 84 acres in 12 days, how many men will it take to mow 220 acres in 11 days?

46. Multiply the sum of $3\frac{5}{8}$ and $21\frac{1}{8}$ by their difference, and express the result as a decimal fraction.

47. If £1 is worth 25.3 francs, find the value of £4, 7s. 6d. in French money.

48. Reduce to its simplest form $\frac{\frac{5}{7} \text{ of } \frac{3}{10}}{3\frac{3}{7} - \frac{3}{14}} \div \frac{\frac{5}{7} + \frac{3}{10}}{3\frac{3}{7} + \frac{3}{14}}$

49. Add together $\frac{4}{9}$ of a guinea, $\frac{5}{16}$ of a £, and $\frac{3}{8}$ of a crown; and reduce their sum to the fraction of £10, 9s. 6d.

50. Find the difference between .0625 ton and 3.125 qr., and reduce the result to the decimal of half a ton.

51. If 3 oz. of gold be worth £12.0125, what is the value of a nugget weighing 2.4375 lb.?

52. Express as a decimal fraction :

$$\left(\frac{1\frac{1}{2}}{2} - \frac{1\frac{1}{2}}{3}\right) - \left(\frac{1\frac{1}{2}}{4} - \frac{1\frac{1}{2}}{5}\right)$$

53. What is meant by the Greatest Common Measure? Find the G.C.M. of 924, 378, 612, 246.

54. Find the value of .4 of 3s. 9d. + .27 of 1 guinea - .023 of £10.33.

55. What is meant by the Least Common Multiple? Find the L.C.M. of 24, 27, 28, 32, 36, 56.

56. If X can do $\frac{3}{4}$ of a piece of work in 2 hours, and Y $\frac{2}{3}$ of the remainder in one hour, while Z can finish it in 10 min., in what time could they do it all working together? (See solution, page 49.)

57. Reduce 60 feet to the decimal of 1 mile 487 yd. (to 7 places of decimals).

58. Reduce $\frac{5\frac{1}{9} \text{ of } 5\frac{1}{4}}{8\frac{1}{4} - 5\frac{1}{8}} \div \frac{4\frac{1}{8} \times 7\frac{1}{5}}{8\frac{1}{4} + 4\frac{1}{8}}$ to a decimal fraction.

59. Add together $.8\bar{3}$ of a mile + $.4$ of a yard + $.25$ of a foot.

60. What will be the cost of painting the walls of a room at 1s. 7d. per square yard, the length being 19 ft. $10\frac{1}{4}$ in., the breadth 16 ft. $1\frac{3}{4}$ in., and the height 10 ft. 3 in.? Solve by decimals.

61. Find the sum of $\frac{2}{7}$, $\frac{3}{11}$, and $\frac{5}{13}$, and divide it by $\frac{5}{13}$.

62. Simplify $\frac{3\frac{1}{2} \text{ of } 2\frac{1}{10}}{\frac{1}{4} \text{ of } \frac{3}{8} \text{ of } \frac{2\frac{4}{5}}{2\frac{4}{5}}}$

63. Which is the greater, and by how much, $.0475$ of a guinea or $.325$ of half a crown?

64. Reduce the decimals $.125$, $.3$, and $.45$ to a vulgar fraction, and then find their sum.

65. If 48 men can do a piece of work in thirty days, working ten hours per day, how many additional men will be wanted to complete it in twenty days, working eight hours per day?

66. Reduce $4\frac{11}{16}$ crowns to the fraction of $12\frac{1}{2}$ guineas.

67. Divide $.0001$ by 50 .

68. Find the value of $.01875$ of a ton.

69. Simplify $(4\frac{1}{2} + \frac{3}{4} - \frac{7}{8}) \div (4\frac{1}{2} - \frac{3}{4} - \frac{7}{8})$. Express also as a decimal.

70. If A can reap $\frac{4}{9}$ of a field in $2\frac{2}{3}$ days, and B can reap $\frac{3}{8}$ of it in $4\frac{1}{2}$ days, in what time can A and B reap the whole field together?

71. Subtract $\frac{1\frac{1}{2}}{1\frac{1}{4}} \div \frac{3}{2\frac{1}{2}}$ from $\frac{\frac{9}{4} - \frac{2}{3} \text{ of } 1\frac{5}{8}}{\frac{1}{5} \times 3\frac{1}{3} + \frac{1}{1\frac{1}{2}} + \frac{1}{1\frac{5}{8}}}$

72. Simplify $\frac{\frac{3}{16} \text{ of } \pounds.0133}{.0057 \text{ of } 2\frac{1}{2} \text{ guineas}}$

73. Show that $\frac{1\frac{3}{4} - \frac{7}{6} \text{ of } \frac{1\frac{8}{9}}{\frac{1}{5} \text{ of } \frac{1\frac{2}{3}}{20} + 5\frac{1}{2}}}{1 + \frac{1}{2}} = \frac{1}{1 - \frac{1}{2}}$

74. If my share of a picture was $\frac{4}{89}$, and I received $\pounds 12, 3s. 4\frac{1}{2}d.$, what was the picture worth?

75. Simplify the expression $\frac{2\frac{1}{4} - \frac{2}{3} \text{ of } 1\frac{5}{6}}{\frac{1}{5} \text{ of } 3\frac{1}{3} + \frac{1}{3}\frac{2}{3}}$
76. What fraction must be added to the sum of $3\frac{1}{8}$, $4\frac{1}{4}$, $5\frac{1}{6}$, and $\frac{1}{12}$ to make the result a whole number?
77. If a clock gain .6 of a second in 20 minutes, in what time will it gain 20 minutes?
78. By how much is $\frac{2}{7}$ of $\frac{5}{8}$ of $1\frac{4}{5}$ greater than $\frac{2}{5}$ of $\frac{7}{9}$ of $\frac{1}{2}\frac{5}{8}$?
79. What fraction of 5s. $11\frac{1}{2}$ d. is $\frac{1}{14}$ of 7s. 9d.?
80. Divide .000460408 by .0247. Prove your work by vulgar fractions.
81. If A and B, working together, can finish a piece of work in 3 days, B and C in $3\frac{1}{2}$ days, and A and C in 4 days; in what time could they do it, all working together? (See solution, page 49.)
82. Divide $\frac{2}{3}$ of $\frac{1}{8}$ by $\frac{5}{7}$ of $7\frac{3}{8}$, and multiply the quotient by $\frac{1}{4}$ of $\frac{3\frac{1}{2}}{7}$.
83. If $\frac{7}{8}$ of a coal mine cost £780, 1s. 3d., what will $\frac{4}{32}$ cost?
84. Multiply 1.021 by .0037, and divide 16 by .0004; and give the reason for placing the decimal point in each case.
85. Find the value of the expression :

$$\frac{\frac{2}{7} \text{ of } \frac{5}{11} \text{ of } 5\frac{1}{2} \div 2\frac{1}{3}}{\frac{4}{9} \text{ of } \frac{3}{18} \div 8\frac{2}{3}}$$
86. Divide 2 by .64 and .004 by .0001.
87. Simplify $\frac{3.16}{5.17}$ of $\frac{1.2}{.375}$ of $\frac{2.5 \div .025}{4}$
88. Find the average of $17\frac{1}{2}$, $25\frac{1}{4}$, $96\frac{3}{8}$, 10, 0, $42\frac{3}{4}$, and 56.
89. If 7 men earn £10 $\frac{1}{3}$ in $9\frac{1}{4}$ days, how much will 17 men earn in $20\frac{1}{7}$ days?

90. If a piece of work be done in 50 days of 8 hours each by 23 men, in what time will 161 men do a piece of work $3\frac{1}{2}$ times as great?

91. A, B, and C can do a portion of work in 8 days; A is able to do it in 20 days, and C in 24 days. In what time can B do it?

92. If 1.5 lb. of tea cost .06375 of 100s., what would .0875 ton cost?

93. If you owed $\frac{\frac{2}{3} - \frac{1}{8}}{\frac{3}{5} + \frac{1}{4}}$ of £5, 2s., what would be the amount of your debt?

94. A young man received £5000, which was just $\frac{2}{3}$ of $\frac{1}{2}$ of his father's estate? What did the daughter receive to whom her father left $\frac{1}{12}$ of the estate?

95. From $\frac{1}{8}$ of $7\frac{1}{2}$ take $\frac{1}{10}$, and divide the answer by $\frac{2}{3}$ of 12.

96. A train going at the rate of $16\frac{4}{5}$ miles an hour, travels a certain distance in $4\frac{7}{12}$ hours; how long would a train, going at the rate of $20\frac{5}{8}$ miles an hour, be in running the same distance?

97. If the owner of $\frac{4}{17}$ of a ship sold ($\frac{3}{11}$ of $\frac{2}{9}$) of his share for £ $\frac{4000}{33}$, what was the value of ($\frac{1\frac{1}{4}}{4\frac{1}{4}}$ of $\frac{2}{5}$) of the whole ship at the same rate?

98. Find the value of $\frac{3}{4}$ of $\frac{1}{9\frac{1}{2}}$ of £1, 18s. + $\frac{2}{3}$ of 0.0375 of 15s. + $\frac{2}{3}$ of 0.429 of 8s. 3d., and express the result as a decimal of £5.

99. Find the difference between $\frac{\frac{1}{7} - \frac{1}{8}}{\frac{1}{8} + \frac{1}{9}}$ of 19s. 10d., and $\frac{3\frac{1}{4} + 2\frac{1}{5}}{3\frac{1}{4} - 2\frac{1}{5}}$ of $1\frac{3}{4}$ d., and reduce the difference to the fraction of 4s. $5\frac{1}{2}$ d.

100. How many oranges at £.084375 per dozen, ought to be given in exchange for 378 eggs at .0625 shillings each?

101. Arrange in order of magnitude the fractions .06̇, .06̇9, .06̇9̇, .06̇9̇, and express their average decimally.

METHOD OF SOLVING QUESTION 56.

X in 1 hour can do $\frac{2}{3}$ of the work.

Y " " $\frac{2}{3}$ of $\frac{1}{2} = \frac{1}{3}$ of the work.

Z can finish the remainder, that is $\frac{1}{3}$ in 10' ;

∴ in 1 hour he can do $\frac{1}{3}$ of the work.

X, Y, and Z in 1 hour can do $\frac{2}{3} + \frac{1}{3} + \frac{1}{3}$ of the work = $\frac{4}{3}$;

∴ all working together can do the piece of work in

$$\frac{1}{\frac{4}{3}} \text{ hours} = \frac{3}{4} = 57' 36''.$$

METHOD OF SOLVING QUESTION 81.

A and B in 1 day can do $\frac{1}{2}$ of the piece of work.

A and C " " $\frac{1}{2}$ of the piece of work.

A and B in 1 day and A and C in 1 day can do $(\frac{1}{2} + \frac{1}{2})$ of it,
or A in 2 days and B and C in 1 day can do $(\frac{1}{2} + \frac{1}{2})$ of it.

But B and C in 1 day can do $\frac{1}{3\frac{1}{2}}$ of it ;

∴ A alone in 2 days can do $(\frac{1}{2} + \frac{1}{2} - \frac{1}{3\frac{1}{2}})$ of it,

or " " " $\frac{1}{2} + \frac{1}{2} - \frac{1}{3\frac{1}{2}} = \frac{2}{3}$ of it.

A in one day can do $\frac{1}{1\frac{1}{2}}$ of the piece ;

and ∴ A can do the piece of work in $\frac{1}{\frac{2}{3}}$ or $6\frac{1}{2}$ days ;

∴ B " " " $5\frac{1}{2}$ days ;

∴ C " " " $9\frac{1}{2}$ "

and ∴ A + B + C together can do the piece of work in $2\frac{1}{2}$ days.

QUESTION 81 (ANOTHER METHOD).

A and B do $\frac{1}{2}$ of work in 1 day.

B " C " $\frac{2}{3}$ " "

A " C " $\frac{1}{2}$ " "

∴ twice A and twice B and twice C do $\frac{7}{2}$ of work in 1 day.

∴ $2(A + B + C) = \frac{7}{2}$ of work.

∴ A, B, C, do in one day $\frac{1}{12} \div \frac{1}{3} = \frac{1}{12} \times \frac{3}{1} = \frac{1}{4}$ day.

$$\therefore \frac{73}{168} : \frac{168}{168} :: 1 : 2\frac{1}{4}$$

∴ A, B, C do work in $\frac{73 \times 168}{21}$ days.

GREATEST COMMON MEASURE.

A measure of any number is such a number as will divide the given number without a remainder. Thus 2 into 8 goes 4.

A *Common Measure* of two or more numbers is such a number as will divide each of the given numbers without a remainder. Thus, 2 will divide 4, 6, 8, and 10, and is therefore a Common Measure.

The Greatest Common Measure of two or more numbers is the greatest number that will divide each of the given numbers without a remainder. Thus, 8 is the highest number that will divide 16 and 24, and is therefore the Greatest Common Measure of 16 and 24.

LEAST COMMON MULTIPLE.

A multiple of any number is a number which will contain the other so many times without a remainder. Thus, 24 is a multiple of 2.

A Common Multiple of two or more numbers is such a number as will contain each of the given numbers so many times without a remainder. Thus, 24 is a Common Multiple of 2, 3, 6, 8, and 12.

The Least Common Multiple of two or more numbers is the *least* number that will contain each of the others without a remainder. Thus, 24 is the L. C. M. of 2, 3, 6, 8, and 12.

*END OF FIRST YEAR—FEMALES.***ARITHMETIC.**

1. A leg of mutton, weighing $9\frac{1}{2}$ lb., cost 6s. 4d. ; find the value of 6 sheep, each weighing 1 cwt. 2 lb., at the same price.

2. If 10 men do a piece of work in 9 days, how many men will do another piece, four times as great, in two-thirds of the time ?

3. If £240 gain £16 in 6 months, what sum will gain £5, 6s. 8d. in 8 months ?

4. A gentleman pays a tax of 4d. in the pound, amounting to £21, 13s. 4d. ; on how much money was the tax paid ?

5. What sum will gain £16, 8s. in five years, if £100 gain £4 in one year ?

6. If 24 men consume 240 lb. of beef in 2 weeks, how many lbs. will 18 men consume in 8 weeks ?

7. If the sixpenny loaf weighs 2 lb. 3 oz., when wheat is selling at 64s. per quarter, what should it weigh when wheat is selling at 56s. ?

8. If 3 men earn £15 in 20 days, how many men will earn 15 guineas in 9 days, at the same rate ?

9. If a family of 9 persons consume 18s. worth of bread in two weeks, when wheat is 8s. per bushel, how much money will it require for a family of 12 persons, when wheat is 7s. per bushel ?

10. How many dozen copy-books, at 2½d. each, can be bought for £9 ?

11. Bought 113 cwt. of coffee for £632, 16s., and sold it at 1s. 10d. per lb. ; what was my total gain ?

12. If 16 men consume £3, 10s. worth of bread in 3 weeks, when wheat is £4, 16s. a quarter, what value of bread will they eat in the same time, when wheat is 7s. a bushel?

13. If the rent of 11 ac. 3 ro. of land be £42, what will be the rent of 1 ac. 1 ro. 35 po.?

14. If 40 horses can plough 60 acres of land in 2 days of 8 hours each, how many hours a day must 50 horses work to plough 80 acres in 3 days?

15. The amount of work A can do is to the amount B can do, as 3 is to 5. In what time will both together do a piece of work that would take A alone 6 days to do?

16. What quantity of cloth can be bought for £15, 10s. 10d., if $10\frac{1}{2}$ yd. can be bought for half-a guinea?

17. A bankrupt owes A £72, 6s. 8d.; B £118, 5s. 9d.; C £103, 6s. 5d.; his assets are £205, 7s. 6d. How much can he pay in the pound?

18. If the interest of £60 for 5 years amount to ten guineas, what will be the interest of £100 for a year?

19. If the 4d. loaf weigh 2 lb. 3 oz., when wheat is 7s. $1\frac{1}{2}$ d. per bushel, what should it weigh when wheat is 7s. 11d. per bushel?

20. If 7 men take 15 days to do a certain work, how many men should be hired to do a work twice as large in three times the time?

21. How long should 39 men take to do what 38 men did in 39 days?

22. A room 31 ft. 6 in. long, and 23 ft. 10 in. broad, is to be covered with carpet $\frac{3}{4}$ of a yard wide. What length of carpet will be required?

23. What do the taxes on a house rented at £327, 12s. 6d. amount to, when the taxes on a house rented at 35 guineas are £6, 8s. $7\frac{1}{2}$ d.?

24. If 14 men, in 15 days, do five-twelfths of a certain

work, find the smallest number of men that could do the remaining seven-twelfths in 28 days.

25. The interest on £232, 11s. $7\frac{1}{2}$ d., for 10 months, is £10, 2s. $8\frac{1}{2}$ d.; what sum would yield the same interest in 17 months?

26. The money I spend is to the money I save in the proportion of 5 : 3; what sum must I have earned before my savings amount to £75?

27. A bankrupt's goods are valued at £365, 18s. 10d., and his debts amount to £1392, 15s. $6\frac{1}{2}$ d.; how much can he pay in the pound?

28. If 161 lb. of tea are given in exchange for 12 cwt. 21 lb. of sugar, at $5\frac{3}{4}$ d. per lb., what is the price of the tea per lb.?

29. If 49 men can do a piece of work in 130 days of 8 hours, how many hours a day must 196 men work to do as much in 26 days?

30. If 1 ton 16 cwt. 3 qr. 20 lb. cost £2, 15s. 8d., how much will 3 tons $11\frac{1}{2}$ cwt. cost?

31. If 36 horses can carry 24 loads 3 miles in a day, how many loads can 60 horses carry 5 miles in the same time?

32. My income, after deducting $6\frac{1}{2}$ d. per pound of income tax, is £467. Find my gross income.

33. A grocer bought 2 tons 3 cwt. 3 qr. of sugar for £120, and paid £50 of expenses; how much must be charged per cwt. to have a clear profit of £61, 5s.?

34. If for £1, 4s. I have 1200 lb. carried 36 miles, how many lbs. can I have carried 24 miles for the same money?

35. How many yards of cloth can I get for 36s. $8\frac{1}{2}$ d., when I can get 7 pieces, each containing $2\frac{1}{2}$ yd. of cloth, for a guinea?

36. What length of wall, 2 ft. broad and 12 ft. high, can be built by 32 men in 26 days, working 9 hours a day; if a wall 300 yd. long, 3 ft. broad, and 10 ft. high, can be built by 48 men in 130 days, working 6 hours a day?

37. How many yards of velvet, at 15s. 9d. per yard, should be given in exchange for 315 yd. of silk, at 8s. 7½d. per yard?

38. If 500 men have provisions for 85 days, and if after 17 days, 75 of the men go away, find how long the remaining provisions will serve the number left.

39. If £6 is sufficient to maintain 9 labourers for a fortnight, when corn is at 28s. per qr., how much will be required to maintain 6 labourers 35 days, when corn is at 32s. per qr.?

40. Multiply £563, 7s. 9½d. by 1674.

41. If 7 men can mow 84 acres in 12 days, how many men will it take to mow 220 acres in 11 days?

42. Find the dividend on £566, 19s. 3d., at 10s. 11½d. in the pound, neglecting fractions of a farthing.

43. How much will a creditor lose on a debt of £2671, 2s. 6d., when a bankrupt can only pay 13s. 4d. in the pound?

44. If the poor-rate on property having an annual rental of £1325, 15s., be £33, 2s. 10½d., what amount of poor-rate should be paid on a house having a rental of 30 guineas?

45. A parcel of 5 lb. 7 oz. is carried 120 miles for 2s. 6d.; how far, at the same rate, will 16 lb. 5 oz. be carried for 5s. 7½d.?

46. If 300 labourers can make an embankment in 48 days, in how many *more* days will 60 *fewer* do it?

47. A family may live for three months in the country for £24, 10s.; what will be required to maintain them in town for 9 months, supposing £3 in the country to be equivalent to £4 in town?

48. An express train moves 8 times as fast as a man who walks 7 feet in a second. What is the speed of the train, *in miles*, per hour?

49. If 25 ducks and 100 chickens cost £9, 7s. 6d., and one duck and one chicken cost 4s. 6d., find the price of a duck and a chicken respectively.

50. A market-woman buys herrings at 2s. 8d. the hundred of six score, and retails them at 4s. 6d. the true hundred; how many must she sell to gain half a sovereign?

51. The ratable value of a parish is £7280, and a sum of £91 has to be raised by rate; how much per pound must the rate be?

52. If the carriage of 16 cwt. of sugar, for 32 miles, be 5s. 10d., what will the carriage of 11 tons 8 lb., for the same distance, amount to?

53. A merchant bought 3 pieces of cloth, each measuring 3 yd. 3 qr. 3 nl., at 1s. 8d. per yard; how much did he pay for the whole?

54. If 4 tons 5 cwt. are carried 40 miles for 14s. 2d., how far will 5 tons 10 cwt. be carried for £1, 7s. 6d.?

55. If ten men do a piece of work in twenty-four days, how many men will be required to do a piece of work seven times as great in one-fifth of the time?

56. If the 8d. loaf weighs 42 oz. when wheat is 54s. per qr., what should be the price of wheat when the 6d. loaf weighs 28 oz.?

57. If 6 men in 10 days of 9 hours each plough 56 ac., how many days of 10 hours each will 5 men take to plough 70 ac.?

58. If 6 bricklayers build a wall 18 yd. long in 3 days of 9 hours each, how many would be required to build another wall of the same height and thickness, but 33 yd. long, in 9 days of 11 hours each?

59. A field, containing 24 ac., is mown by 8 men in 12 days; how many acres could 12 men mow in 15 days?

60. The carriage of 12 cwt. for 30 miles cost 12s. 6d.; how much ought to be paid for the carriage of 3 tons 45 miles?

61. If a courier performs a journey in 15 days of 9 hours each, in how many days of $7\frac{1}{2}$ hours each should he do the same?

62. A grocer bought 25 cwt. 3 qr. 18 lb. of sugar for £64, 8s. 6d.; how must he sell it per cwt. to gain £8, 17s. 6d. on the whole?

63. If 40 men require £20 worth of bread in 10 days, when the wheat is at 63s. per qr., how long would £90 worth serve 54 men when wheat is at 56s. a qr.?

64. Twenty-four masons build 36 yd. of a garden wall, which is to be 108 yd. long, in 9 days, working 10 hours a day; how many must be employed to finish the wall in 6 days of 9 hours each?

65. What will be the value of 11 yd. of cloth, when 3 pieces, each containing 25 English ells, are sold for £17 $\frac{1}{2}$?

66. If 10 horses consume 7 bush. 2 pk. of oats in 7 days, how much will 28 horses consume in 10 days?

67. What must a field, $13\frac{1}{2}$ po. in breadth, be in length in order that its area may be 2 ac.?

68. A grocer gave £50 for 16 cwt. 2 qr. 18 lb. of sugar, and he lost £8 by retailing it; at what rate did he sell it per lb.?

69. Multiply £5, 17s. 6d. by 2758.

70. Divide 178 cwt. 3 qr. 14 lb. by 53.

71. If 15 men can reap a field in 9 days, and when half the work is done, 5 men are obliged to leave, in how many days will the remainder finish it?

72. Tobacco being sold at the rate of 1s. 6d. for 4 oz., how much should I have to give for a cake of tobacco weighing 16 lb. 2 oz.?

73. If 3 parcels of hops, each weighing $2\frac{1}{2}$ cwt., are worth £30, 15s., what is the price per cwt.?

74. How many hours a day must 30 men work, during 3 days, to perform as much as 12 men did in 8 days, *working 10 hours a day*?

75. Add together $\frac{2}{5}$, $\frac{4}{9}$, $\frac{3}{10}$, and $\frac{7}{18}$, and divide the result by $7\frac{5}{8}$.

76. Reduce $\frac{3}{4}$ of $\frac{1}{2}$ guinea to the fraction of a £.

77. A bankrupt's effects amount to $\frac{3}{5}$ of his debts; how much can he pay in the pound?

78. What number is that from which, if there be taken $\frac{2}{7}$ of $\frac{3}{8}$, and to the remainder $\frac{8}{15}$ of $\frac{5}{16}$ be added, the sum will be 10?

79. Find, by Practice, the rent of a house for 5 years 73 days, at the rate of £12, 10s. per annum.

80. How many yards of cloth, 3 qr. wide, will line a cloak that is $1\frac{3}{4}$ yd. in length, and $3\frac{1}{2}$ yd. wide?

81. If a person can travel 490 miles in 14 days, walking 10 hours a day, how far will he travel in 6 days, walking 8 hours a day?

82. If 24 men dig a trench 54 yd. long in 36 days, working 6 hours a day, how many will dig a trench 48 yd. long in 32 days, working 8 hours a day?

83. If 12 men earn 15s. $4\frac{1}{2}$ d., how many men, at this rate, will earn £1, 5s. $7\frac{1}{2}$ d.?

84. If 265 women in a factory each earn £17, 19s. $5\frac{1}{2}$ d. per year, what are the total earnings for a year?

85. Find the value of 9 ac. of land, at 2s. 6d. per sq. yd.

86. How many yards, at 13s. 4d. a yd., can be bought for £100?

87. If 8 months' provisions for 90 sailors cost £1440, what will be the cost of the provisions for 30 sailors for 20 months?

88. If 360 men, in 8 months, consume 140 qr. of wheat, how many quarters will be required for the consumption of 810 men for $3\frac{1}{2}$ months?

89. If the charge for digging a trench 30 ft. long, 18 ft. 6 in. wide, and 8 ft. 9 in. deep, be £50, 10s., how much more would it cost to make it 5 ft. longer, and 9 in. deeper?

90. A bankrupt's debts amount to £5856, but his assets are sufficient to pay 18s. 11 $\frac{1}{4}$ d. in the £. What will be lost by a creditor to whom one quarter of the bankrupt's debts is owing?

91. If a man rode 107 miles in 3 $\frac{1}{4}$ hours, how long would he take in going 588 $\frac{1}{2}$ miles?

92. If 7500 men eat 180 tons of food in 6 weeks, how many tons will 1884 men eat in 35 weeks?

93. A garrison of 1000 men, which was victualled for 60 days, was reinforced at the end of 18 days, and then the provisions were exhausted in 30 days. How many men were in the reinforcement?

94. If the carriage of 15 tons 17 cwt. 1 qr. of goods for 257 $\frac{3}{4}$ miles cost £16, 6s. 7 $\frac{1}{2}$ d., what weight, at the same rate, will be carried 211 $\frac{1}{2}$ miles for £21, 15s. 6d.?

95. A wall that was to be raised 36 ft. high was raised 9 ft. in 6 days by 16 men; how many more men must be employed to finish it in 4 days?

96. Working 10 hours a day, it takes 15 labourers 18 days to dig 450 yd.; how many men, working two hours a day, would in 8 days finish 480 yd.?

97. An upright stick, 2 ft. 6 in. long, casts a shadow 3 ft. 2 in. long; how high is a tower which, at the same time of the same day, casts a shadow 60 ft. long? (Work by Rule of Three, and prove your result by the 'Method of Unity'.)

98. If a job can be finished in 45 days by 35 men, and if the men drop off 7 at a time at the end of every 15 days, how long will it be before the job is finished?

99. If 4 men, or 6 women, or 9 boys, can perform a piece of work in 27 $\frac{1}{2}$ days, in what time can (a) five men and nine women perform it; and (b) five men and eight boys perform it?

100. How many hours a day must 20 men work, to accomplish as much in 5 days as 25 men could do in 4 days if they worked 6 hours a day?

END OF FIRST YEAR—MALES AND FEMALES.

DICTION

Is always 'A short passage of prose to be selected by the Inspector, read over once, and then slowly dictated.'

PENMANSHIP.

Write in large hand, as a specimen of copy setting, the word :

'Valetudinarian,' 'Reconciliation,' 'Authoritatively,' 'Manufacturers,' 'Indispensable,' 'Irrefragable,' 'Phraseology,' 'Impracticable,' 'Glyphography,' 'Symphony,' 'Undistinguishable,' 'Volatilises,' 'Mechanically,' 'Variability,' 'Imperturbability,' 'Typographical,' 'Etymologically,' 'Idiosyncrasy,' 'Superintendence,' 'Longitudinally.'

Write, in small hand, as a specimen of copy-setting, the following sentence :

'The faculties are improved by exercise.'
 'Cultivate habits of punctuality.'
 'Now fades the glimmering landscape on the sight.'
 'Accommodate yourself to your company.'
 'Punctually fulfil all your obligations.'
 'Unsepulchred they roamed, and shrieked each wandering ghost.'
 'Wickedness carries with itself a torment.'
 'Honesty is the best policy.'
 'Friendship multiplies joys and divides griefs.'
 'Pleasure always hunts for novelty.'
 'Intrusive forests quit the cultured ground.'
 'Catch perchance some flashing glimpse of green.'
 'Forgiveness is the noblest revenge.'
 'A stouter champion never handled sword.'
 'Sir Philip Sydney displayed undaunted courage at Zutphen.'
 'Hope springs eternal in the human breast.'
 'The spearman heard the bugle sound.'
 'The ploughman homeward plods his weary way.'

'America was discovered by Columbus, 1492.'

'Their furrow oft the stubborn glebe has broke.'

COMPOSITION.

Write, from memory, the substance of the passage read by the Inspector, or a short letter.

END OF FIRST YEAR—MALES AND FEMALES.

GRAMMAR.

1. Parse the words in *Italics* in the following passage, showing their relations :

'While we see multitudes *passing* before us, of whom, *perhaps*, not one appears to deserve our notice or *excite* our sympathy, we *should* remember that we *likewise* are *lost* in the same throng; that the eye which happens to glance upon us *is* turned in a moment on him *that* follows.'

2. How are adverbs compared? Make a list of irregular comparisons.

3. When is *that* used instead of *who* or *which*? Give examples.

4. Parse the words in *Italics* in the following passage, and show their relations :

'It is remarkable that *those whom* the world *least* accuses, *accuse* themselves *the most*; and that a foolish speech, which at the time of its utterance *was unobserved* as *such* by all who heard it, shall yet remain fixed in the memory of him who pronounced it, with a tenacity *which* he vainly seeks to communicate to *more* agreeable subjects of reflection.'

5. Give examples showing how some words can be used both as prepositions and as adverbs.

6. Explain the force of *self* and *ever* in compound pronouns.

7. Parse the words in *Italics* in the following passage, and show their relations :

' *This* fear of any future difficulties or misfortunes is so natural to the mind, that *were* a man's sorrows or disquietudes *summed up* at the end of his life, it would generally be found that he had suffered *more* from the apprehension of such evils *as* never *happened* to him, than from those evils *which* had really *befallen* him.'

8. Classify the following adverbs: *After, always, perhaps, may, within, certainly, possibly, there.*

9. Parse the pronouns in the following sentences :

- (1) The day is ours ; (2) Love one another ;
(3) Who was it that you thought of ?

10. Parse fully the words in Italics in the following passage :

' *Alas!* the joys *that* fortune brings
Are trifling, and *decay* ;
And *those who* prize the paltry things
More trifling still than *they*.'

11. To what parts of speech do prepositions join nouns (or pronouns)? Give examples.

12. How many parts of speech may each of the following words be: *But, that, as before, past, more*? Give an example of each usage.

13. Parse fully the word in Italics in the following passage :

'He loosed his hold, and *his* English heart
Took part with the *dead* before him,
And he honoured the brave *who* died *sword* in hand,
As with softened brow he leaned o'er him.
A *soldier's* death thou hast boldly died,
A soldier's *grave* won by it ;
Before I would take *that* sword from thine hand
My own life's blood should dye it'

14. Give sentences showing the use of *what* (a) as an Interrogative, direct and indirect ; and (b) as a Compound Relative.

15. Correct or justify the following expressions, giving your reasons :

Who do you think was there? He did not act at all manly in that affair. How bright the stars shine to-night. The spider and fly are natural enemies. The decline and fall of the Roman Empire. A man whose inclinations led him to be corrupt, and had nevertheless the grandest abilities.

16. Parse fully the words in Italics in the following passage :

'I *appeal* to the experience of every man, *who* is in the habit of *exercising* his mind vigorously and *well*, whether there is *not* a satisfaction in it, *which* tells *him* he *has been acting up to one* of the great objects of his existence.'

17. Form adverbs from nouns and other adverbs by prefixing *a*.

18. Make short sentences containing these words as *pronouns*: *One, that, either*; and explain how, in the sentence '*Whatever things are true should be followed after,*' '*whatever*' may be broken up and parsed.

19. Parse as fully as you can the Italics in the following passage :

'He *that* will look into many parts of Asia and America, *will find* men *reason* there, perhaps *as acutely as himself*, *who* yet never *heard* of a syllogism.'

20. Classify the different kinds of adverbs, giving an example of each.

21. Parse fully the words in Italics in the following passage :

'The idea of honour *is associated* with war. But to *whom* does this honour belong? If to *any*, *certainly not* to the mass of the people, but to *those who* are particularly engaged in it. The mass of a people who *stay* at home and hire *others* to fight—certainly this mass reaps little honour from war.'

22. Define a preposition, and give examples of words that are both prepositions and adverbs.

23. Give a full classification of pronouns, with one *example* of each kind.

24. Parse the *verbs*, *pronouns*, and *adverbs* in the following lines :

‘Spake full well, in language quaint and olden,
One who dwelleth by the castled Rhine,
When he called the flowers, so blue and golden,
Stars, that in earth’s firmament do shine.’

25. Show, by writing short sentences as examples, that each of the words *full*, *one*, and *by* may be used as *two* different parts of speech.

26. ‘As the hackney boat, *which* carries passengers from Leyden to Amsterdam, was putting *off*, a boy running *along* the side of the canal desired to be taken in; *which* the master of the boat refused, because the lad had not quite money *enough* to pay the usual fare. An eminent *merchant*, being pleased with the looks of the boy, and secretly *touched* with compassion towards him, paid the money for him.’

(a) Select the adverbs from the above passage, stating the words which they modify.

(b) Select the prepositions, and state the words which they govern.

27. Parse the words in *Italics*, and be careful to state what is the antecedent of *which*.

28. Illustrate the use of *before*, as an *adverb*, a *preposition*, and *adjective*.

29. Parse fully, with special attention to their relations, the words in *Italics* in the following passage :

‘*Here* is a form of government that has lasted, with modifications to suit the spirit of successive ages, *for* a period of eight hundred years. *How* is it that I account for the permanence of its institutions? By *asserting* that, in their *outline* plan, *they* combine all the good of material importance *that has been discovered*.’

30. State *fully* the function of a relative pronoun. Point out the relative element in *whence* and *whereby* in these phrases, ‘The place whence I come,’ ‘The means whereby he works.’

31. Write short sentences illustrating the different significations of the preposition *of*.

32. Parse with syntax the words in *Italics* in the following passage :

'The boy stood on the burning deck, whence all *but him had fled*,
The flames *that* lit the battle's wreck *shone* round him o'er the dead,
Yet *beautiful* and bright he stood, as *born* to rule the storm,
A creature of heroic blood, a *proud* though childlike form.'

33. Classify the following adverbs: *Well, yes, here, secondly, soon, beautifully.*

34. 'I am justly surprised at your *treating me* in this manner; since, *whatever lot I have drawn*, I did not choose: if, therefore, it be *worthy* of your derision, you *should compassionate me*, for it *might have fallen* to any of your shares.'

Parse the words in *Italics*.

35. Define the adverbs. Give a classification of adverbs, and arrange under its different heads the adverbs which occur in the above passage.

36. Give examples of adverbs that admit of comparison.

37. Parse fully the words in *Italics* in the following passage :

'Beyond his native vale the peasant *never* looked ;
But thought the visual line, *that girt him round*,
The world's *extreme* ; and *thought* the silver moon,
That *nightly* o'er him led her virgin host,
No broader than his father's *shield*.'

38. Classify English pronouns, and carefully distinguish between *thou* and *you* as used for the second person in the singular number.

39. Show by means of examples, that each of the following words can at least be two different parts of speech :
Only, which, but, one.

40. Parse the words in *Italics* in the following passage :

'*More near, from out* the Caesar's palace came
The owl's long cry, and, *interruptedly*,
Of distant sentinels the fitful song.'

41. Enumerate the various classes of pronouns, and give an example of each.

42. Classify the following adverbs: *Soon, somewhere, how, almost, why, no, yes.*

43. Parse the words in Italics in the following passage:

*'There I suck the liquid air,
All amidst the gardens fair
Of Hesperus and his daughters three
That sing about the golden tree.'*

44. Give examples of adverbs formed from the *noun*, the *pronoun*, the *adjective*, and the *preposition*.

45. State, with examples, some of the relations expressed by prepositions.

46. Parse the words in Italics in the following passage:

*'He who ascends to mountain tops, shall find
The loftiest peaks most wrapt in clouds and snow;
He who surpasses or subdues mankind,
Must look down on the hate of those below.'*

47. Classify the pronouns, and give examples.

48. Form sentences to show the use of *between, beyond, since, up*, as adverbs, and as prepositions.

49. Mention the various classes of adjectives, and give examples of each.

50. What parts of speech may the word *that* be? In parsing it, how do you determine what part of speech it is?

51. Certain words may be either adverbs or prepositions, according to the manner in which they are used. Give examples of such words, with sentences illustrating this variable use.

52. Parse the words in Italics in the following passage:

'The branch of industry for which Egypt is peculiarly well adapted by nature is agriculture, and large quantities of cereals are raised and exported; yet in that country, where three successive crops can be gathered in one year, agriculture is in a very low state, the natural consequence of the wretched condition of the heavily taxed people engaged in it.'

SPECIMENS OF ANALYSIS.

'Tis good to speak in kindly guise,
And soothe where'er we can ;

Fair speech should bind the human mind,
And love link man to man.'

| MAJOR ANALYSIS. | | | | MINOR ANALYSIS. | | | | | | |
|-----------------|-------------------------------------|---|----------|-----------------|----------|------------------------------|------------------|---------------|----------------|----------------------|
| No. | Clauses. | Kind of Clause. | Sent. | Connection. | Subject. | Attribute. | Pred. | Ext. of Pred. | Object. | Attribute of Object. |
| (a) | 'Tis good soothe. | Princ. cl. | | | It | to speak . . . and soothe | is good | | | |
| (b) | Where'er we can. | Sub. adv. to (a), mod. 'speak' and 'soothe.' | Compound | Where'er | we | | can | | | |
| (c) | Fair speech mind. | Princ. cl. co-or. to (a) and (d) | | | speech | Fair | should bind | | | mind |
| (d) | And love to man. | Princ. cl. co-or. to (a) and (c). | | And | love | | (should) link | | man to man. | |

'Many a good ship has lost that tide which might have led to fortune, because it was thought unlucky to begin the voyage on a Friday.'

| MAJOR ANALYSIS. | | | | MINOR ANALYSIS. | | | | | | |
|-----------------|---|---------------------------------|---------|-----------------|----------|--|----------------|---------------|-------------------|----------------------|
| No. | Clauses. | Kind of Cl. | Sent. | Connc. | Subject. | Attribute of Subject. | Pred. | Ext. of Pred. | Object. | Attribute of Object. |
| (a) | Many a good . . . tide. | Princ. cl. | | | ship | Many a good | has lost | | tide | that |
| (b) | Which might . . . to fortune. | Sub. adj. clause to 'tide' (a). | Complex | | which | | might have led | | to fortune (ind.) | |
| (c) | Because it was thought . . . on a Friday. | Sub. adv. clause of reason. | | Because | it | to begin the voyage on a Friday (complement of subject). | was thought | | unlucky * | |

* Passive verbs take a direct object when the active form takes two objects.—Vide Trotter, page 63, Rule XXXI., Oba. 2.

SPECIMENS OF ANALYSIS.

'Tis good to speak in kindly guise, Fair speech should bind the human mind,
 And soothe where'er we can ; And love link man to man.'

| MAJOR ANALYSIS. | | | | MINOR ANALYSIS. | | | | | | |
|-----------------|------------------------------------|---|----------|-----------------|----------|------------------------------|------------------|---------------|----------------|----------------------|
| No. | Clauses. | Kind of Clause. | Sent. | Connection. | Subject. | Attribute. | Pred. | Ext. of Pred. | Object. | Attribute of Object. |
| (a) | "Tis good soothe. | Princ. cl. | | | It | to speak . . . and soothe | is good | | | |
| (b) | Where'er we can. | Sub. adv. to (a), mod. 'speak' and 'soothe.' | Compound | Where'er | we | | can | | | |
| (c) | Fair speech mind. | Princ. cl. co-or. to (a) and (d) | | | speech | Fair | should bind | | mind | the human |
| (d) | And love to man. | Princ. cl. co-or. to (a) and (c). | | And | love | | (should) link | | man to man. | |

'Many a good ship has lost that tide which might have led to fortune, because it was thought unlucky to begin the voyage on a Friday.'

| MAJOR ANALYSIS. | | | | MINOR ANALYSIS. | | | | | | |
|-----------------|---|---------------------------------|---------|-----------------|------------|--|----------------|---------------|-------------------|----------------------|
| No. | Clauses. | Kind of Cl. | Sent. | Connc. | Subject. | Attribute of Subject. | Pred. | Ext. of Pred. | Object. | Attribute of Object. |
| (a) | Many a good . . . tide. | Princ. cl. | | | ship | Many a good | has lost | | tide | that |
| (b) | Which might . . . to fortune. | Sub. adj. clause to 'tide' (a). | Complex | | which | | might have led | | to fortune (ind.) | |
| (c) | Because it was thought . . . on a Friday. | Sub. adv. clause of reason. | | | Because it | to begin the voyage on a Friday (complement of subject). | was thought | | unlucky * | |

* Passive verbs take a direct object when the active form takes two objects.—Vide Trotter, page 63, Rule XXXI., Obs. 2.

'Like most men, as he grew more selfish, he was tolerably successful in deceiving himself as to his motives and state of mind.'

| MAJOR ANALYSIS. | | | | MINOR ANALYSIS. | | | | | | |
|-----------------|---|-------------------|---------|-----------------|----------|-----------------------|----------------|---|------|---------------|
| No. | Clauses. | Kind of Cl. | Sent. | Conn. | Subject. | Attribute to Subject. | Pred. | Ext. of Predicate. | Obj. | Attr. of Obj. |
| (a) | He, like most men, was tolerably successful. . . state of mind. | Principal. | | | He | like most men | was successful | tolerably (deg.) in deceiving himself of mind (Limitation). | | |
| (b) | As he grew more selfish. | Sub. adv. to (a). | Complex | As | he | | grew selfish | more (deg.) | | |

END OF FIRST YEAR—MALES AND FEMALES.

GEOGRAPHY.

1. Enumerate the various mountain ranges of England, giving their exact position, direction, and chief summits.

2. Give a list of the manufactures of Scotland, with the districts and chief towns in which they are carried on.

3. Give the *exact* position of the following places, and say for what they are noted: Londonderry, Lakes of Killarney, Salisbury, Peterhead, Stonehenge, Hastings, St Andrews, and Ben Nevis.

4. Draw a map of the coast from Hamburg to Bordeaux, marking and naming the countries, the capes, the river mouths, and the seaports.

5. 'Most of the rivers in Europe flow either to the north-west or to the south-east.' Show fully that this is true, and mention all the *exceptions* you know.

6. Tell as exactly as you can where the following places are, and mention anything you know about them: Namur, Seville, Buda, Bradford, Trieste, Kiel, Navarino.

7. Draw a map of France or Spain, marking the mountain ranges and the chief places engaged in the wine trade.

8. Mention the chief towns in the basin of the Danube, and state for what they are noted.

9. What are the chief fortified towns in the north of Europe?

10. Draw a map of the Baltic, and mark the chief rivers that flow into it, and the seaports on its shores.

11. What are the chief fortified places in the south of Europe?

12. Where are the following, and for what are they noted : Bologna, Adrianople, Missolonghi, Naples, Pesth, Magdeburg, Rheims, and Nîmes?

13. Draw a map of the Black Sea, marking the seaports and mouths of the European rivers.

14. Give a short account of the products and export trade of Russia.

15. State the positions of the following places, and for what they are noted : Kiel, Danzig, Elba, Ajaccio, Mentone, Baden, Leipzig, and Pisa.

16. Draw a map of the coast of Europe from Gibraltar to Calais, marking the positions of the chief seaports, mountains, and rivers.

17. Give a short account of the products, the manufactures, and the trade of Ireland.

18. Mention the chief towns in Russia, and give their situation.

19. Draw a map of the entire shore of the German Ocean, marking the mouths of the chief rivers flowing into it, and the positions of the chief seaports.

20. Give the positions of the following places, and state for what they are noted : Metz, Avignon, Sevastopol, Granada, Spezzia, Brindisi, Potsdam.

21. Describe the mountain and river systems of Spain.

22. Sketch the Mediterranean coast from Gibraltar to Trieste, inserting capes, bays, and the following towns : Barcelona, Leghorn, Brindisi, Naples, Toulon, Nice, Genoa.

23. What are the exports from Italy, Spain, and Russia respectively?

24. Where are Elsinore, Toledo, Mont Blanc, Bordeaux, the Bosphorus? Say what you know of each of them.

25. Draw a map of the English Channel, marking the islands, capes, and seaports of both coasts.

26. Name one chief seaport in each of the following countries : Russia, Austria, Spain, Turkey, Holland, Italy, and describe the situation and trade of each of them.

27. Give an account of the physical features and trade of Switzerland.

28. Draw a map of Russia in Europe, inserting the principal towns and rivers.

29. Describe the course of the river Elbe, mentioning the towns on or near it.

30. Give the position of the following towns, and say for what they are noted : Cherbourg, Cadiz, Rotterdam, Odessa, Stockholm, Bergen, Marseilles.

31. Draw the coast-line of the Mediterranean from Trieste to Constantinople, marking the river-mouths, capes, and chief seaports.

32. What continental towns have manufactures of silk and lace respectively ?

33. Where are the following towns, and what are their chief exports : Leghorn, Danzig, Rotterdam, Malaga, Bordeaux, Drontheim ?

34. Draw the coast-line of the continent from Calais to Cape Finisterre, marking the capes, river-mouths, and seaports.

35. Give an account of the river drainage of Russia.

36. Where are the following places, and for what are they noted : Dresden, Leipzig, Brindisi, Cannes, Milan, Novgorod, Lyons, Bremen ?

37. Draw a map of the White Sea, marking the river-mouths, capes, and chief towns on the coast.

38. Describe the course of the Danube, enumerating in order the principal tributaries, and naming four towns on the main stream.

39. Where are the following places situated, and for what historical event are they remarkable : Leyden, Badajoz, Plevna, Tilsit, Prague, Augsburg, Alexandria, Avignon, Kiel ?

40. Draw a map of Italy, showing its boundaries, physical features, and *six* principal towns.

41. Describe the positions of the Black and Adriatic Seas, naming the rivers flowing into them.

42. Where and for what noted are : Cadiz, Turin, Archangel, Leghorn, Matapan, Leyden, Varna ?

43. Draw a full map of the Baltic Sea, naming seaports, and showing at least one degree of latitude and longitude.

44. Describe the course of the Rhine, naming its tributaries, and objects of interest on its banks.

45. Where and for what noted are : Lipari, Kiev, Stockport, Malaga, Antwerp, Munich, Metz, Strasburg ?

46. Draw a map of the west coast of Europe from Denmark to the Strait of Gibraltar, naming capes and river-mouths.

47. Describe the course of the Danube, telling the countries that form its basin, and name the chief towns on its banks.

48. Where, and for what noted are : Stromboli, Malta, Athlone, L'Orient, Odessa, Zurich, Trieste ?

49. Give some details of those mountain ranges in Europe which form national boundaries.

50. What are the chief ports of the Baltic, and in what do they trade ?

51. Draw an outline map of Italy, indicating the leading capes and bays.

52. Draw an outline map of Scotland, marking the positions of Glasgow, Peterhead, Cape Wrath, Kinnaird's Head, Girdleness, Loch Ness, Loch Lomond, and Ben Nevis.

53. Describe, in words, the course of the Rhone, and name the tributaries on its left bank.

54. On what rivers, and in what countries, are Orleans, *Hamburg*, *Strasburg*, *Magdeburg*, *Ulm*, and *Frankfort* ?

55. Draw a map of the Black Sea, indicating carefully its entrance, and the great rivers and ports connected with it.

56. Describe, in words, the basin of the Danube, noting particularly its boundaries and its chief cities.

57. In what countries, and on what rivers, are Hamburg, Cologne, Rouen, Liverpool, Limerick, Lyons, Rotterdam, Florence? Give particulars of the first, third, sixth, and eighth.

END OF FIRST YEAR—MALES AND FEMALES.

HISTORY.

1. Name, in order, with dates, the sovereigns who ruled over Scotland during the sixteenth century, and give particulars regarding one of them.

2. Give, with dates, the circumstances attending the deaths of Robert I., Robert III., James I., and James III.

3. Trace the descent of George I., showing his right to the crown of Britain.

4. Explain and distinguish between the unions effected in 1603, 1707, and 1801, with special reference to the benefits which flowed from the second.

5. What circumstances led to the War of Independence in America? Give the dates of the first and last battles, and of the treaty by which the war was concluded.

6. State the various reasons for William III.'s accession to the throne of England.

7. Who were the chief literary men in the reign of Queen Anne? Give a short account of any one of them.

8. State what you know of the conduct of Ireland during the Protectorate.

9. What were the events that led to the Revolution of 1688?

10. Write a short account of a Prime Minister of the reign of George III.

11. Trace the descent of James I. of England from Henry VII. Give dates.

12. Mention the leading battles of the Civil War in the reign of Charles I.

13. Describe carefully the events that led to the massacre of Glencoe, with the dates.

14. Mention some of the results of the union of the Parliaments of England and Scotland.

15. Give a brief account of the Dutch War in the time of Cromwell.

16. Mention, with dates and the names of the commanders on each side, the leading battles in which the British took part, from 1740 to 1790.

17. Give a short account of Graham of Claverhouse.

18. What do you know of the Seven Years' War, Pride's Purge, and the Remonstrance?

19. Give a short account of the last Jacobite rebellion.

20. State what you know of the massacre of Glencoe.

21. Give dates and a few notes regarding any three of the following: Petition of Right, Act of Uniformity, Declaration of Indulgence, Treaty of Amiens.

22. Mention the chief causes of the Revolution of 1688.

23. Tell what you know about Sir Walter Raleigh.

24. Who were Laud and Strafford? What part did they play in the history of King Charles I.'s reign?

25. Give a short account of the second Jacobite rebellion.

26. Give a short account of the Guy Fawkes Plot.

27. What rebellions took place in England and Scotland on the accession of James II.?

28. Give the principal events and dates of the war with the American colonies.

29. Explain the following terms: Puritan, Jesuit, Huguenot, Non-juror, Covenanter.

30. Tell what you know about the first Jacobite rebellion.

31. Give, with dates, a list of the principal battles in the Peninsular War.

32. Mention in order the principal incidents of the struggle between Charles I. and his Parliament.

33. What led to the Peninsular War? Give particulars of its progress to the occupation of Torres Vedras. After what victory was Wellesley made a Viscount?

34. Give a short account of any naval wars between this country and Holland in the seventeenth century.

35. Describe the leading events in the reign of Queen Anne.

36. State the provisions of the Act of Settlement.

37. What was Habeas Corpus?

38. Give a short account of the war of the Austrian Succession.

39. Give a brief account of the captivity of Mary, Queen of Scots, in England, with the date of her death.

40. Name the sovereigns of Great Britain from 1615 to 1715, with the dates of their accession.

41. Write short notes on the military career of the Duke of Marlborough. Give the leading dates.

42. Name in order, with the dates of their accession, the Stuart sovereigns of Great Britain.

43. Give a short account of the Gunpowder Plot, with the date.

44. What led to the great Civil War? Name and give the dates of the first and last battles.

45. Give a short account of Cromwell's campaign in Scotland.

46. Who took the lead in the restoration of Charles II.?

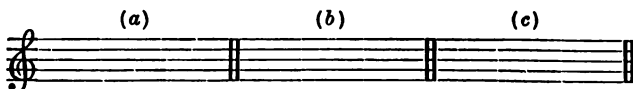
47. Account for the defeat of General Leslie at Dunbar.
 48. Assign events to the following dates: 1215, 1298, 1314, 1400, 1485, 1532, 1603, 1620, 1628, 1679, 1707, 1714, 1715, 1745, 1837.

END OF FIRST YEAR—MALES AND FEMALES.

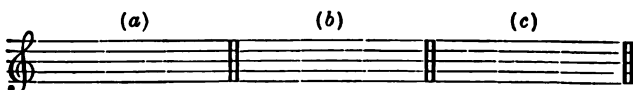
MUSIC.

(Optional—to be worked in 15 minutes—three questions.)

1. What is meant by *major*? what by *minor*? and how does a major differ from a minor scale?
2. What is a *minor triad*? Write in *a*, *b*, and *c*, severally, the minor triads of C (*do*), F (*fa*), and G (*sol*):

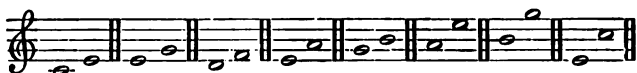


3. What is a scale? Describe the difference between a diatonic and a chromatic scale.
4. What is a bar? What are the chief uses of the bar in music?
5. Write in *a*, *b*, and *c*, severally, the major triads of F# (*fe*), C (*do*), and F (*fa*). What is a triad?



6. How many tones, and how many semitones, are found in the ascending unaltered minor scale; and what are the places in it of the latter?
7. How many tones, and how many semitones, are found in the ascending major scale; and what are the places therein?

8. Write under each of the following intervals its name (major third, minor third, perfect fourth, and so on):



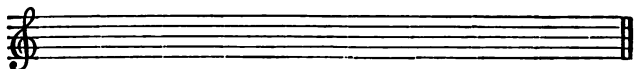
9. Write under each of the following rests the value-name of the note to which it corresponds:



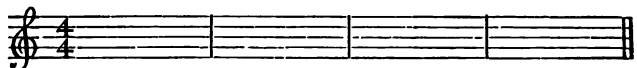
10. Add the proper signatures to the following:



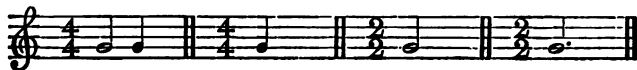
11. Write out the perfect fourths (or major fourths, as they are sometimes called) found between the notes of the scale of C (*do*):



12. Write the following one octave higher:

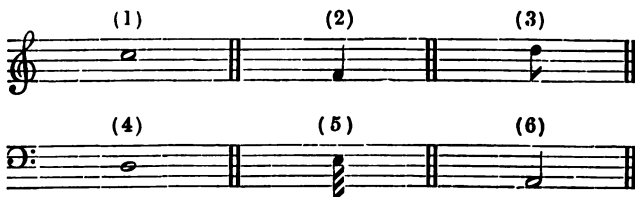


13. Complete the following bars by adding rests:



STAFF NOTATION.

14. Write (1) above each of the following notes its scale-name (C or *do*, D or *re*, &c.), and (2) below each of the notes its value-name (semibreve, minim, &c.):



15. Write below each of the following intervals its name (major third, &c.):



16. Add the proper time-signature to each of the following:



TONIC SOL-FA NOTATION.

17. What is the interval (1) between *me* and *lah*, and (2) between *ray* and *fah*?

18. Write the pulse signs for three-pulse measure.

19. Write (using two-pulse measure) one note continued through four pulses.

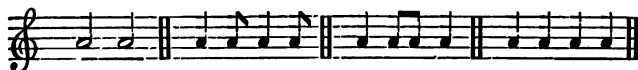
STAFF NOTATION.

20. Write below each of the following intervals its name (minor third, &c.):



21. Write the key-signatures of each of the following keys: (1) A; (2) B flat; (3) G; (4) E flat; (5) D.

22. Add time-signatures to each of the following:



TONIC SOL-FA NOTATION.

23. What is the interval (major third, &c.) (a) between *ray* and *fah*, (b) between *soh* and *doh*¹, (c) between *doh* and *fah*, (d) between *doh* and *lah*, (e) between *doh* and *me*?

24. (a) Which are the strong tones of the scale, and (b) which are the leading tones?

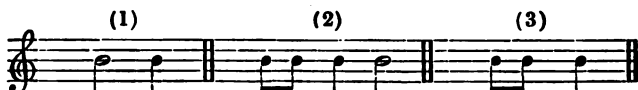
25. Write (a) a four-pulse measure, (b) a six-pulse measure, and (c) a nine-pulse measure, all in primary form.

STAFF NOTATION.

26. Write above each of the following notes its pitch-name (C, D, or *do*, *re*, &c.), and below write the signs for rests corresponding in value to the notes:



27. Add proper time-signatures to the following :



28. Write below each of the following intervals its name (major fourth, &c.) :



TONIC SOL-FA NOTATION.

29. Write (using three-pulse measure) one note continued through six pulses.

30. Write the ascending scale from *doh* to *doh*¹.

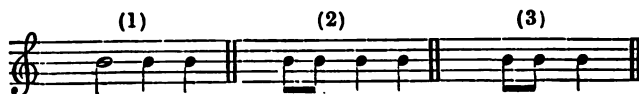
31. Write the names of the following intervals: (1) *fah* to *lah*; (2) *soh* to *te*; (3) *soh* to *ray*¹; (4) *fah* to *te*.

STAFF NOTATION.

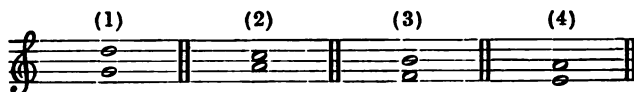
32. Write above each of the following notes its pitch-name (C, D, &c.), and below write the signs for rests corresponding in value to the notes :



33. Add the proper time-signatures to the following :



34. Write below each of the following intervals its name (major fourth, &c.) :



TONIC SOL-FA NOTATION.

35. Re-write the following, doubling the value of every note :

| s : f . m | l : — |

36. What do 'Key G,' 'Key C,' mean at the beginning of a tune ?

37. Write the names of the following intervals : (1) *soh* to *ray*¹ ; (2) *lah* to *doh*¹ ; (3) *fah* to *te* ; (4) *me* to *lah*.

STAFF NOTATION.

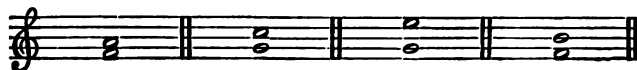
38. Write above each of the following notes its pitch-name (C, D, &c.), and below write the signs for rests corresponding in value to the notes :



39. Add the proper time-signatures to the following :



40. Write below each of the following intervals its name (major fourth, &c.) :



TONIC SOL-FA NOTATION.

41. Write (1) a six-pulse tone, using three-pulse measure, and (2) a four-pulse tone, using two-pulse measure.

42. Write the names of the following intervals: (1) *fah* to *lah*; (2) *soh* to *doh*¹; (3) *soh* to *me*¹; (4) *fah* to *te*.

43. Write the following an octave higher, and state what is meant by the direction 'Key F:'

Key F.

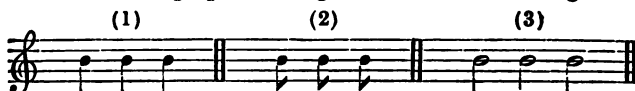
| d : s₁ | m₁ : l | s₁ : t₁ | l₁ : t₁ | d : — ||

STAFF NOTATION.

44. Write above each of the following notes its pitch-name (C, D, &c.), and below write the signs for rests corresponding in value to the notes:



45. Add the proper time-signatures to the following:



46. Write below each of the following intervals its name (major fourth, &c.):



TONIC SOL-FA NOTATION.

47. Re-write the following, doubling the value of every note:

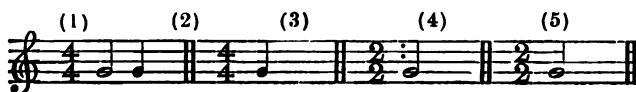
| m : — | f : r | l : s | s : — ||

48. What do 'Key A,' 'Key B,' mean at the beginning of a tune?

49. Write the names of the following intervals: (1) *soh* to *lah*; (2) *te* to *doh*¹; (3) *me* to *doh*¹; (4) *fah* to *te*.

STAFF NOTATION.

50. Write above each of the following notes its pitch-name (C, D, &c.), and below write the signs for rests corresponding in value to the notes:



51. Add proper time-signatures to the following:



52. Write below each of the following intervals its name (major fourth, &c.):



TONIC SOL-FA NOTATION.

53. Write (1) a six-pulse tone, using two-pulse measure, and (2) a six-pulse tone, using three-pulse measure.

54. Write the names of the following intervals: (1) *fah* to *me*; (2) *soh* to *te*; (3) *fah* to *me*¹; (4) *fah* to *te*.

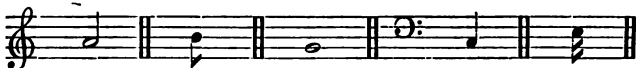
55. Write the following an octave higher, and state what is meant by the direction 'Key G:'

Key G.

| d : s | m : f | s : l | r : s \ m : — ||

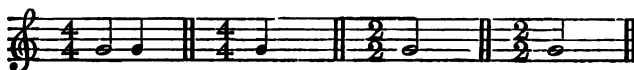
STAFF NOTATION.

56. Write above each of the following notes its value-name (semibreve, &c.), and below each its pitch-name (C, D, E, &c.):



57. Write down the minor thirds contained between the notes of the scale of C.

58. Add proper time-signatures to each of the following:



TONIC SOL-FA NOTATION.

59. Write a six-pulse tone, using three-pulse measures.

60. Write down the minor thirds contained between the notes of the common scale.

61. Write the following an octave higher:

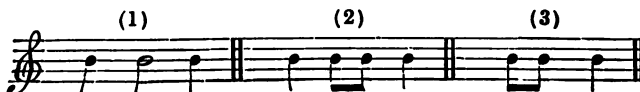
s m l t₁ f m r l₁ t₁ d

STAFF NOTATION.

62. Write above each of the following notes its pitch-name (C, D, &c.), and below write the signs for rests corresponding in value to the notes:



63. Add proper time-signatures to the following:



64. Write below each of the following intervals its name (major fourth, &c.):



TONIC SOL-FA NOTATION.

65. Write a four-pulse note, using two-pulse measure.

66. Write the names of the following intervals: (1) *fah* to *lah*; (2) *soh* to *doh*¹; (3) *lah* to *me*¹; (4) *fah* to *te*.

67. Write the following an octave lower, and state what is meant by the direction 'Key F:'

Key F.

m¹ r¹ d¹ t r¹ l s t d¹

ANSWERS TO QUESTIONS IN ARITHMETIC.

CANDIDATES—MALES.

- | | |
|---|---|
| (1) £22, 16s. | (26) £159, 13s. $9\frac{1}{2}$ d. $\frac{1}{2}$ g. |
| (2) 60 men. | (27) £744. |
| (3) £10, 6s. $4\frac{1}{4}$ d. $\frac{1}{2}$. | (28) 8 days. |
| (4) £13,987, 19s. $2\frac{3}{4}$ d. | (29) £17,289, 19s. $5\frac{3}{4}$ d. |
| (5) £1300. | (30) £450, 10s. $1\frac{1}{4}$ d. $\frac{1}{4}$. |
| (6) £82. | (31) 78 yd. 2 ft. $1\frac{1}{7}$ in. |
| (7) £336, 1s. 3d. | (32) 10 ac. 1 ro. |
| (8) 2 lb. 8 oz. | (33) £18, 14s. 11d. |
| (9) 7 men. | (34) 45 men. |
| (10) £62, 12s. $1\frac{1}{2}$ d. | (35) £24, 19s. gain. |
| (11) £206, 13s. 4d. | (36) 437 ac. 2 ro. |
| (12) 637 lb. | (37) £16,487, 11s. 7d. |
| (13) £543, 17s. $3\frac{3}{4}$ d. | (38) 9 hours. |
| (14) £456, 5s. $11\frac{1}{2}$ d. | (39) $522\frac{2}{11}$ lb. |
| (15) £13, 10s. $11\frac{1}{4}$ d. | (40) £1 gain. |
| (16) 5s. $7\frac{1}{2}$ d. | (41) £311, 8s. |
| (17) $4\frac{28}{121}$ yd. | (42) £79, 8s. 3d. |
| (18) £17,365, 6s. $8\frac{3}{4}$ d. | (43) 74 yd. |
| (19) £321, 8s. $5\frac{1}{2}$ d. $\frac{7}{12}$. | (44) 15 days. |
| (20) 28 days. | (45) Value of oxen, £11,900; value of sheep, £15,961, 8s. |
| (21) 55 yd. 2 qr. | (46) 142 miles 5 fur. 16 po. 3 yd. 1 ft. 4 in. |
| (22) £1389. | (47) £1914, 6s. $11\frac{1}{2}$ d. |
| (23) £59, 1s. 3d. | |
| (24) 9 men. | |
| (25) £358, 16s. | |

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| (48) 10,000 bricks. | (75) £45,371, 18s. $2\frac{1}{6}$ d. |
| (49) £22,824, 17s. $8\frac{1}{2}$ d. | (76) $643\frac{1}{2}$ miles. |
| (50) £217, 4s. $5\frac{1}{2}$ d. $\frac{1}{2}$. | (77) £4713, 1s. $6\frac{3}{4}$ d. |
| (51) £2362, 10s. | (78) £20,446, 4s. $3\frac{3}{4}$ d. |
| (52) 6440 men. | (79) £11,110, 18s. $10\frac{1}{8}$ d. |
| (53) £981, 1s. 8d. | (80) 170 gall. |
| (54) £420, 13s. $1\frac{1}{2}$ d. | (81) £22, 8s. $0\frac{1}{2}$ d. $\frac{7}{18}$. |
| (55) 720 men. | (82) $78\frac{3}{4}$ yd. |
| (56) 3 cwt. 0 qr. 27 lb. + | (83) £753,717, 19s. $8\frac{1}{2}$ d. |
| (57) 112 men additional. | (84) £114,417, 17s. $9\frac{3}{4}$ d. |
| (58) £380, 6s. $7\frac{1}{4}$ d. $\frac{1}{2}$. | (85) $11\frac{7}{8}$ oz. |
| (59) £236, 5s. 10d. | (86) 6 months. |
| (60) 56s. | (87) £5997, 14s. $7\frac{1}{8}$ d. |
| (61) $1462\frac{1}{2}$ ac. | (88) £36,453, 9s. $2\frac{5}{12}$ d. |
| (62) $45\frac{1}{8}$ days. | (89) £1550. |
| (63) $15\frac{2}{3}$ miles. | (90) $3\frac{3}{4}$ per cent. |
| (64) £40, 12s. 6d. | (91) £2185, 8s. $6\frac{3}{4}$ d. |
| (65) £2, 2s. 8d. | (92) £437, 4s. $8\frac{1}{11}$ d. |
| (66) £322, 7s. 6d. | (93) £26, 11s. $7\frac{3}{4}$ d. $\frac{3}{4}\frac{9}{10}$. |
| (67) £48, 4s. $10\frac{1}{2}$ d. | (94) £2157, 6s. $8\frac{1}{2}$ d. $\frac{1}{2}$. |
| (68) £318, 17s. $4\frac{1}{4}$ d. $\frac{1}{4}$. | (95) 65 ac. 3 ro. $12\frac{4}{7}$ po. |
| (69) £21, 12s. gain. | (96) £33 $\frac{1}{2}$. |
| (70) £191, 17s. $9\frac{1}{4}$ d. $\frac{1}{8}$. | (97) £7929, 3s. 4d. |
| (71) 10 hours. | (98) 1s. $1\frac{1}{2}$ d. |
| (72) £14,316, 11s. $8\frac{5}{11}$ d. | (99) £37, 10s. $0\frac{1}{2}$ d. $\frac{1}{8}$. |
| (73) £1156, 0s. $7\frac{1}{2}$ d. | (100) 98 workmen. |
| (74) £73,230, 8s. $7\frac{1}{2}$ d. | |

CANDIDATES—FEMALES.

- | | |
|---|---|
| (1) £510. | (29) £96, 4s. 7 $\frac{1}{2}$ d. $\frac{5}{7}$. |
| (2) £7, 15s. 5 $\frac{1}{2}$ d. | (30) £8, 2s. 10 $\frac{1}{4}$ d. |
| (3) £1, 9s. 1 $\frac{1}{2}$ d. | (31) £15,647, 9s. 5 $\frac{3}{4}$ d. |
| (4) £336, 1s. 3d. | (32) £3, 17s. 10 $\frac{3}{4}$ d. $\frac{1}{10}$. |
| (5) £5467, 10s. 2d. | (33) £51, 14s. 3 $\frac{1}{2}$ d. $\frac{1}{2}$. |
| (6) £8, 16s. | (34) £188, 9s. 4 $\frac{1}{2}$ d. |
| (7) £5112, 2s. 5 $\frac{1}{2}$ d. | (35) £1443, 18s. 9d. |
| (8) £62, 12s. 1 $\frac{1}{2}$ d. | (36) £9, 15s. 5 $\frac{1}{4}$ d. |
| (9) £1, 4s. 9d. | (37) £11,900, price of oxen; £15,925, price of sheep; total, £27,825. |
| (10) £7237, 19s. 9 $\frac{1}{2}$ d. | (38) 142 miles 5 fur. 16 po. 3 yd. 1 ft. 4 in. |
| (11) £27, 17s. 3 $\frac{1}{2}$ d. | (39) £1914, 6s. 11 $\frac{1}{2}$ d. |
| (12) £2, 6s. 5 $\frac{1}{2}$ d. | (40) £4195, 13s. 6d. |
| (13) £39, 17s. 4 $\frac{1}{4}$ d. $\frac{1}{2}$. | (41) £56, 4s. 0 $\frac{3}{4}$ d. |
| (14) £1301, 6s. | (42) £16, 6s. 8 $\frac{3}{4}$ d. |
| (15) £1833, 16s. 5 $\frac{1}{4}$ d. | (43) £3664, 10s. 3d. |
| (16) £1195, 15s. 11 $\frac{1}{4}$ d. | (44) £13, 9s. 3 $\frac{1}{2}$ d. |
| (17) £20, 19s. 11 $\frac{1}{4}$ d. $\frac{1}{4}$. | (45) £480, 19s. 9d. |
| (18) £585, 12s. 6 $\frac{3}{4}$ d. $\frac{2}{3}$. | (46) £186, 4s. 11 $\frac{1}{2}$ d. $\frac{2}{7}$. |
| (19) £1477, 4s. 4d. | (47) £11,035, 6s. 3 $\frac{3}{4}$ d. |
| (20) £4724, 6s. 1 $\frac{1}{2}$ d. | (48) £40, 2s. 0 $\frac{3}{4}$ d. |
| (21) £12, 17s. 10 $\frac{3}{4}$ d. | (49) £17,841, 17s. 9 $\frac{3}{4}$ d. |
| (22) £6985, 6s. 10 $\frac{1}{2}$ d. | (50) £23, 6s. 6 $\frac{3}{4}$ d. |
| (23) £30, 5s. 7 $\frac{3}{4}$ d. | (51) 144 lb. |
| (24) £283, 11s. 11 $\frac{1}{2}$ d. $\frac{1}{2}$. | (52) £969, 7s. 11 $\frac{1}{2}$ d. |
| (25) £233, 8s. 9d. | (53) £7, 16s. 1 $\frac{1}{4}$ d. gain. |
| (26) £12, 9s. 8 $\frac{1}{4}$ d. | |
| (27) £13, 7s. 6d. | |
| (28) £24,312. | |

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| (54) £21, 2s. $9\frac{1}{2}$ d. | (76) £3, 5s. $10\frac{1}{4}$ d. |
| (55) £193. | (77) £1184, 12s. 6d. |
| (56) £4588, 13s. $9\frac{1}{2}$ d. | (78) £96,998, 10s. 6d. |
| (57) $45\frac{3}{8}$ lb. of tea. | (79) £47, 15s. $8\frac{1}{8}\frac{1}{2}$ d. |
| (58) £31, 15s. $6\frac{1}{2}$ d. | (80) £128, 2s. 1d. |
| (59) $427\frac{4}{15}$ lb. of brass. | (81) £4, 0s. $8\frac{3}{4}$ d. |
| (60) £4045, 5s. $8\frac{3}{4}$ d. | (82) £452, 8s. 6d. |
| (61) £239, 9s. 10d. | (83) £521, 11s. $6\frac{3}{4}$ d. |
| (62) 7 hours 57 min. 15 sec. | (84) £35, 19s. $5\frac{1}{2}$ d. $\frac{1}{2}$. |
| (63) 266,160 half-hours. | (85) £23, 17s. $0\frac{1}{2}$ d. |
| (64) £650, 2s. $3\frac{1}{2}$ d. | (86) £669, 3s. 9d. |
| (65) £232, 0s. $9\frac{1}{2}$ d. | (87) £215, 16s. $8\frac{3}{4}$ d. |
| (66) £14,116, 1s. | (88) £64, 3s. $0\frac{1}{2}$ d. |
| (67) £737, 15s. $10\frac{1}{2}$ d. | (89) £4, 9s. $5\frac{3}{4}\frac{3}{8}$ d. |
| (68) £848, 16s. $3\frac{9}{16}$ d. $\frac{9}{16}$. | (90) £77, 19s. $2\frac{1}{4}$ d. |
| (69) £381, 18s. $11\frac{1}{4}$ d. $\frac{7}{8}$. | (91) £9, 3s. $3\frac{1}{4}$ d. |
| (70) £9, 7s. 2d. | (92) £86, 7s. $7\frac{3}{4}$ d. $\frac{1}{8}$. |
| (71) £4, 0s. $11\frac{5}{8}$ d. | (93) £181, 1s. $1\frac{1}{2}$ d. $\frac{3}{8}$. |
| (72) $247\frac{1}{2}$ lb. of tea ; $1897\frac{1}{2}$ lb. of sugar ; 2530 lb. of rice ; 759 lb. of coffee. | (94) £572, 1s. 9d. |
| (73) £1532, 13s. $0\frac{1}{2}$ d. $\frac{1}{16}$. | (95) £330, 14s. $6\frac{1}{4}$ d. |
| (74) £116, 2s. $6\frac{3}{4}$ d. $\frac{1}{8}$. | (96) 24 days. |
| (75) £25, 4s. | (97) £5896, 8s. $8\frac{1}{2}$ d. |
| | (98) £1, 0s. $0\frac{1}{4}$ d. |
| | (99) £40, 5s. |
| | (100) £207, 7s. 6d. |

END OF FIRST YEAR—MALES.

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|---|---|
| (1) (a) 32.67578125; | (24) $1\frac{1}{16}$. |
| (b) .91875. | (25) .5 of a guinea. |
| (2) £405. | (26) $1\frac{1}{1000}$. |
| (3) 2. | (27) $15\frac{34}{99}$. |
| (4) £3, 17s. 9 $\frac{1}{4}$ d. $\frac{1}{33}$. | (28) $1\frac{1}{23}$. |
| (5) £380. | (29) $12\frac{519}{880}$. |
| (6) (a) .075 of £5; | (30) .015527 + |
| (b) 3.38 difference. | (31) 3 $\frac{3}{4}$ days. |
| (7) (a) .13125 of £1; | (32) 25. |
| (b) $\frac{8}{16}$ or .1875 of £1. | (33) £10, 10s. |
| (8) £22 $\frac{3}{4}$ of £28.14 = $\frac{321}{402}$. | (34) $\frac{8}{88}$. |
| (9) $\frac{1}{7}$ of 8 is greater by $\frac{2}{88}$. | (35) 8 cwt. 3 qr. 0 lb. 2 $\frac{118}{168}$ oz. |
| (10) 1 ac. 2 ro. 5 $\frac{3}{4}$ po. | (36) .0953125. |
| (11) 19 $\frac{2}{7}$. | (37) 86.25, or 1 hour 26 min. |
| (12) £1, 3s. per ton of coals. | 15 sec. |
| (13) See page 50. | (38) 4999.95556 + |
| (14) (a) .011; (b) .0011; | (39) Each sailor's share, |
| (c) 110. | £4, 13s. 9d.; value |
| (15) $1\frac{18}{80} = 1.43$. | of prize, £1200. |
| (16) 17s. 6d. | (40) $\frac{11}{10}$ or $1\frac{1}{10}$. |
| (17) 6.8. | (41) $\frac{25}{48}$. |
| (18) $\frac{188}{11}, 5\frac{4}{9}, \frac{8}{21}, 2\frac{1}{19}, \frac{2}{3}$. | (42) £28, 16s. |
| (19) 307.8. | (43) 4 qr. 20 lb. 13 $\frac{1}{2}$ oz. |
| (20) $29\frac{229}{804}$. | (44) £943, 114, 3s. 3d. |
| (21) $\frac{37}{87}$. | (45) 20 men. |
| (22) .4459. | (46) 5.91796875. |
| (23) 1.714285. | (47) 110.6875 francs. |
| | (48) $\frac{17}{41}$. |

- (49) $\frac{1}{12}$.
 (50) .046875.
 (51) £117, 2s. 5 $\frac{1}{4}$ d.
 (52) .175.
 (53) G.C.M. 6. See page 50.
 (54) 1s. 8d. + 5s. 10d. -
 4s. 9 $\frac{1}{8}$ d. = 2s. 8 $\frac{2}{8}$ d.
 (55) 6048.
 (56) 57 min. 36 sec.
 (57) .0089007 +
 (58) 4.08.
 (59) 6 fur. 26 po. 4 yd. 0 ft.
 7 in.
 (60) £6, 9s. 10d.
 (61) 2 $\frac{17}{8}$ $\frac{4}{8}$.
 (62) 81 $\frac{2}{3}$.
 (63) .0475 by 2 $\frac{2}{4}$ d. $\frac{2}{2}$ $\frac{2}{5}$.
 (64) $\frac{3}{8}$ $\frac{2}{8}$ $\frac{9}{8}$.
 (65) 42 men additional.
 (66) $\frac{5}{8}$.
 (67) .000002.
 (68) 1 qr. 14 lb.
 (69) 1.521073913043478260869565.
 (70) 3 $\frac{1}{3}$ days.
 (71) 0.
 (72) $\frac{1}{6}$.
 (73) Both may be reduced to
 the fraction $\frac{1}{6}$.
 (74) £270, 15s. 1 $\frac{9}{4}$ d. $\frac{1}{2}$.
 (75) 1.
 (76) $\frac{3}{8}$.
 (77) 27 days 18 hr. 40 min.
 (78) $\frac{1}{12}$.
 (79) 1 $\frac{2}{9}$.
 (80) $\frac{460408}{100000000} \div \frac{247}{10000} = .01864$.
 (81) 2 $\frac{2}{8}$ days.
 (82) $\frac{7}{1368}$.
 (83) £445, 15s.
 (84) .0037777 and 40000.
 (85) 25 $\frac{5}{8}$.
 (86) 3.125 and 40.
 (87) 48 $\frac{19}{33}$.
 (88) 35 $\frac{2}{8}$.
 (89) £54, 12s. 11 $\frac{1}{4}$ d. $\frac{11}{18}$ $\frac{67}{18}$.
 (90) 23 $\frac{1}{2}$ $\frac{7}{1}$ days of 8 hours
 each.
 (91) B can do it in 30 days.
 (92) £41, 13s.
 (93) £3, 5s.
 (94) £3125.
 (95) $\frac{7}{40}$.
 (96) 3 $\frac{1}{18}$ hours.
 (97) £1000.
 (98) (a) 4s. 9 $\frac{1}{2}$ d.;
 (b) .047916 of £5.
 (99) $\frac{1}{6}$.
 (100) 168 oranges = 14 doz.
 (101) .069; .069; .069;
 .06; .06; average
 = .06720775.

END OF FIRST YEAR—FEMALES.

- | | |
|---|---|
| (1) £22, 16s. | (29) 10 hours. |
| (2) 60 men. | (30) £5, 7s. 9½d. $\frac{31}{47}$. |
| (3) £60. | (31) 24 loads. |
| (4) £1300. | (32) £480. |
| (5) £82. | (33) £5, 5s. 8½d. $\frac{2}{7}$. |
| (6) 720 lb. | (34) 1800 lb. |
| (7) 2 lb. 8 oz. | (35) 30 $\frac{85}{144}$ yd. |
| (8) 7 men. | (36) 75 yd. |
| (9) 21s. | (37) 172½. |
| (10) 80 doz. | (38) 80 days. |
| (11) £527, 6s. 8d. | (39) £11, 8s. 6¾d. $\frac{2}{3}$. |
| (12) £2, 0s. 10d. | (40) £943, 114, 3s. 3d. |
| (13) £5, 5s. | (41) 20 men. |
| (14) 5 hr. 41 min. 20 sec. | (42) £310, 12s. 11½d. |
| (15) 2½ days. | (43) £890, 7s. 6d. loss. |
| (16) 310 $\frac{5}{8}$ yd. | (44) 15s. 9d. |
| (17) 13s. 11½d. $\frac{26290}{85273}$. | (45) 90 miles. |
| (18) £3, 10s. | (46) 12 more. |
| (19) 1 lb. 15 oz. 8 dr. | (47) £98. |
| (20) 4 $\frac{2}{3}$ men. | (48) 38 $\frac{2}{11}$ miles. |
| (21) 38 days. | (49) Each chicken = 1s.; each duck = 3s. 6d. |
| (22) 111 yd. 8 in. | (50) 439 $\frac{1}{11}$ herrings. |
| (23) £57, 6s. 8½d. | (51) 3d. per pound. |
| (24) 10.5 men. | (52) £4, 0s. 2¾d. $\frac{1}{4}$. |
| (25) £136, 16s. 3d. | (53) 19s. 8¼d. |
| (26) £200. | (54) 60 miles. |
| (27) 5s. 3 $\frac{28901}{88533}$ d. | (55) 350 men. |
| (28) 4s. 0¾d. | |

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| (56) 60s. 9d. | (80) 8 yd. $0\frac{2}{3}$ qr. |
| (57) $13\frac{1}{2}$ days. | (81) 168 miles. |
| (58) 3. | (82) 18 men. |
| (59) 45 ac. | (83) 20 men. |
| (60) £4, 13s. 9d. | (84) £4762, 16s. $5\frac{1}{2}$ d. |
| (61) 18 days. | (85) £5445. |
| (62) £2, 16s. $6\frac{3}{4}$ d. $\frac{1143}{1451}$. | (86) 150 yd. |
| (63) $37\frac{1}{2}$ days. | (87) £1200. |
| (64) 80 masons. | (88) $137\frac{1}{8}$ qr. |
| (65) £2, 1s. $0\frac{3}{4}$ d. $\frac{1}{5}$. | (89) £13, 9s. 4d. |
| (66) 30 bush. | (90) £77, 15s. 6d. |
| (67) $23\frac{1}{2}$ po. | (91) 17 hr. $52\frac{1}{2}$ min. |
| (68) $5\frac{1}{3}\frac{2}{11}$ d. | (92) $263\frac{1}{2}\frac{9}{8}$ tons. |
| (69) £16,203, 5s. | (93) 400 men. |
| (70) 3 cwt. 1 qr. 14 lb. | (94) 25 tons 15 cwt. 2 qr. |
| (71) $6\frac{3}{4}$ days. | (95) 56 men. |
| (72) £4, 16s. 9d. | (96) 180 men. |
| (73) £4, 2s. | (97) 47 ft. $4\frac{6}{16}$ in. |
| (74) $10\frac{2}{3}$ hr. a day. | (98) 75 days. |
| (75) $\frac{184}{915}$. | (99) (a) 10 days; |
| (76) $\frac{63}{160}$ of £1. | (b) $12\frac{6}{7}$ days. |
| (77) 12s. per £. | (100) 6 hr. a day—the same |
| (78) $9\frac{7}{84}$. | number of hours |
| (79) £65. | exactly. |

THE END.

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